CLIMATIC™ 60

User manual

BALTIC™
FLEXY™

Rooftop units

CL60_ROOFTOP-IOM-0412-E

CLIMATIC™ 60 ROOFTOP

CONTROL MANUAL

Ref : CL60_ROOFTOP-IOM-0412-E

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CLIMATIC™ 60 CONTROLLER

The new generation of microprocessor based control, CLIMATIC™ 60 may be fitted to the LENNOX rooftop range. It inherits 20 years of technology and field operating experience from its predecessors the CLIMATIC™ 1, CLIMATIC™ 2 and CLIMATIC™ 50.
LENNOX has found the latest hardware technology available on the market place and developed software specifically designed for rooftop applications, maximising the LENNOX unit's efficiency and performance.

COMPATIBILITY

This documentation is compatible with the rooftop programs:

- BALTIC range from software version RT060 STD - Vers. 2 - Rev 0.0.

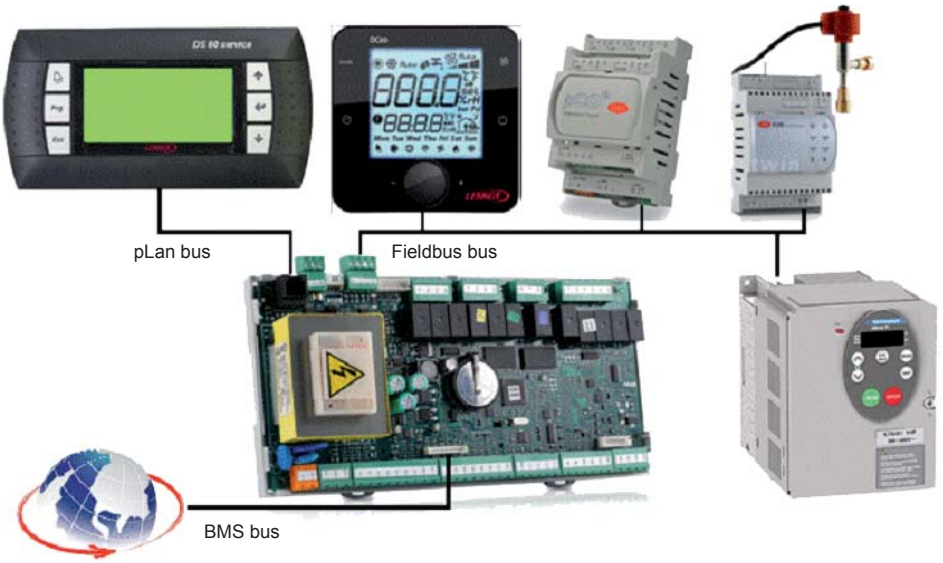
WARNING

Any parameter modification should be carried out by trained and licensed competent technician. Before start-up or restart of a unit controlled by the CLIMATIC™ 60, it is mandatory to check adequacy between CLIMATIC™ 60 and the unit with its options. In case of wrong parameters, the inputs / outputs connections could be incorrect and may create some operation problems for the units and ultimately breakdowns. LENNOX cannot be held responsible for any claims on the units due to a wrong parameters sequence or a parameters modification carried out by non competent technicians. In this case, the warranty will be legally null and void.

DS60 MENU

Throughout the document, parameters and set points which are explained are identified with their address menu where they will be accessible with the display DS60 (ref § DS60 display).
Example, the customer set point explained in the AIR MANAGEMENT § is indicated with the reference (**2222**), meaning that this set point may be changed at the address (**2222**) with the display DS60.
Mainly addresses of parameters accessibles at the «User» level (**2xxx**) are identified in the document.
«Expert level» set points (**3xxx**) accessible with password may be mentioned if they are important for the operation of the unit and not accessible at the «User» level.
The full list of parameters and set point is given at the end of the document.

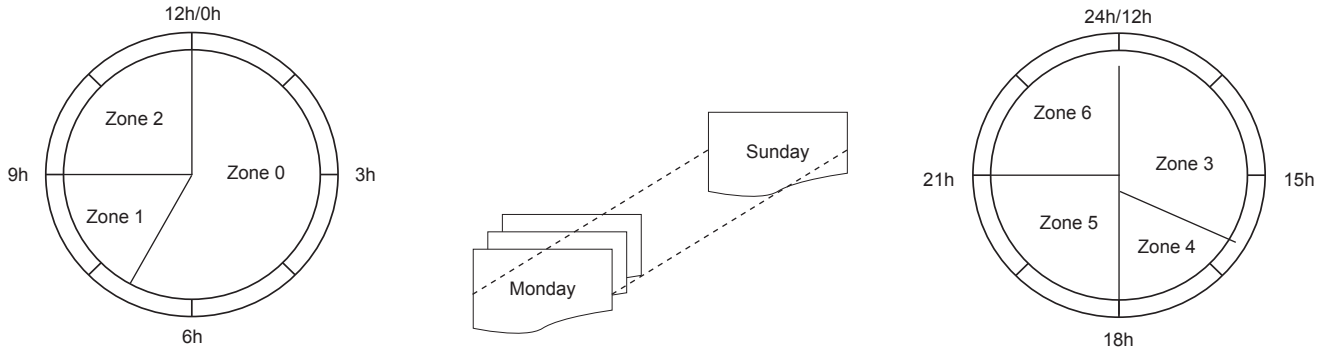
OVERVIEW



SCHEDULING ZONE

Function
The CLIMATIC™ 60 is provided by a real time clock which offers solutions to specify a weekly schedule.

Description
The CLIMATIC™ 60 schedule manages up to 7 different clock zones per day from 00h00 to 24h00 and from Monday to Sunday. The zone can start at different time each day of the week in order to optimise the operating of the unit.



Settings
The different settings to adjust the scheduling zone are available in the menu:

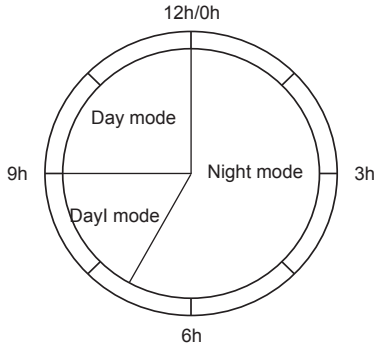
(**2134**):	setting of the number of zone - Changeable only if the Expert mode has been activated
(**2141**):	start time for zone 0, always 00h00 to start each day
(**2142**):	start time of zone 1 adjustable every day from Monday to Sunday
(**2143**):	start time of zone 2 adjustable every day from Monday to Sunday
(**2144**):	start time of zone 3 adjustable every day from Monday to Sunday
(**2145**):	start time of zone 4 adjustable every day from Monday to Sunday
(**2145**):	start time of zone 5 adjustable every day from Monday to Sunday
(**2146**):	start time of zone 6 adjustable every day from Monday to Sunday

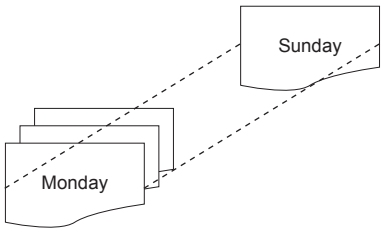
Factory settings:
- Number of zone : 3
- Zone 0 00h00 Monday to Sunday
- Zone 1 06h00 Monday to Saturday
- Zone 2 22h00 Monday to Saturday

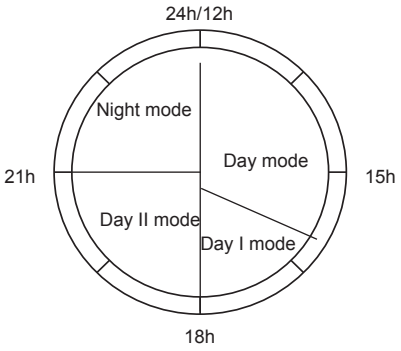
SCHEDULING MODE

Function
The CLIMATIC™ 60 is able to control different modes for each zone in order to optimise the operating of the unit.

Description
The CLIMATIC™ 60 can manage up to 4 different modes. - Night / Day / Day I / Day II







Settings
The different settings to adjust the scheduling mode are available in the menus:

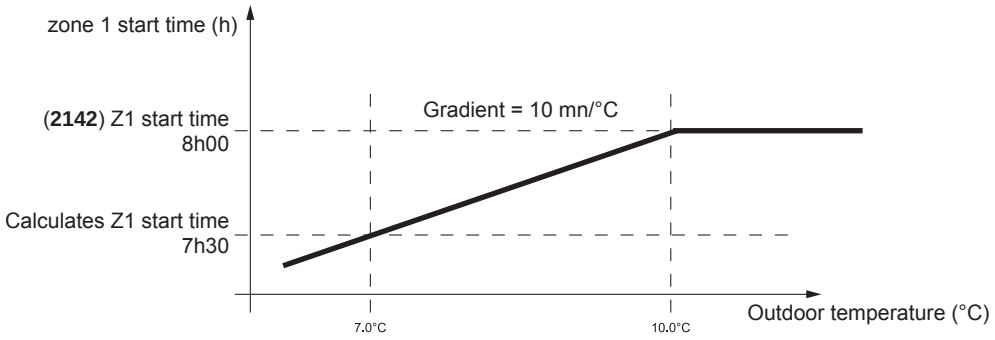
(**2135**):	setting of the number of mode - Changeable only if the Expert mode has been activated
(**2151**):	mode used during the period of zone 0 adjustable every day from Monday to Sunday
(**2152**):	mode used during the period of zone 1 adjustable every day from Monday to Sunday
(**2153**):	mode used during the period of zone 2 adjustable every day from Monday to Sunday
(**2154**):	mode used during the period of zone 3 adjustable every day from Monday to Sunday
(**2155**):	mode used during the period of zone 4 adjustable every day from Monday to Sunday
(**2156**):	mode used during the period of zone 5 adjustable every day from Monday to Sunday
(**2157**):	mode used during the period of zone 6 adjustable every day from Monday to Sunday

Factory settings:
- Number of mode : 3
- Night Mode on Zone 0 from Monday to Sunday
- Day Mode on Zone 1 from Monday to Saturday
- Night Mode on Zone 2 from Monday to Saturday

SCHEDULING ZONE ANTICIPATION

Function
The CLIMATIC™ 60 allows the start up of the unit before the pre-specified hour of the first zone (zone 1) of the day.

Description
This function is able to start the unit in zone 1 earlier if the outdoor temperature is under a specify threshold. The typical application is to start the unit in heating mode if the weather is too cold compare to the actual season.



Example:

(**2142**):	zone 1 start time: 8h00,
(**2161**):	outside air temperature threshold to activate function: 10.0°C,
(**2162**):	gradient (slope): 10 mn/°C.

In this example the foot is set to the value 10.0°C, which means zone 1 will always start at 8h00 if the outside air temperature is higher than 10.0°C. If the outside air temperature is less than 10.0°C zone 1 will start according to the selected gradient and the difference between the foot value and the actual outside air temperature (10.0 - 7.0 = 3.0 x 10 = 30 min). Then, the new start time for zone 1 is 7h30.

Settings
The different settings to adjust the anticipation are available in the menu:

(**2161**):	outside air temperature threshold to activate function
(**2162**):	gradient (slope)

ROOM TEMPERATURE

Function

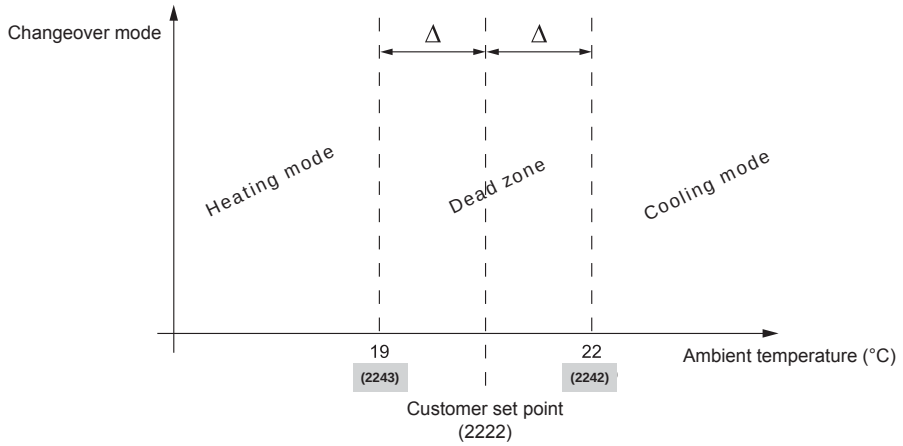
The CLIMATIC™ 60 controls the fresh or heat temperature according to the specifyed set point. The controller is programmed to maintain a temperature as comfortable as possible with the most economic usage of the unit.

Description

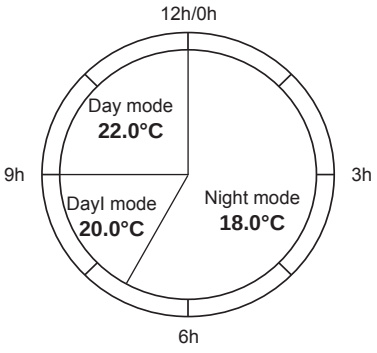
The room temperature is maintained between a minimum threshold (the heating set point) and a maximum threshold (the cooling set point). The dead zone is defined between these 2 thresholds.

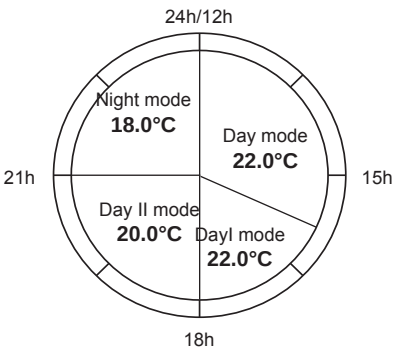
1. Fix value

For a friendly use, a single room temperature set point is used. This setting is set in the middle of the dead zone. If the thresholds **(2243**) or (**2242)** are modified, the set point (**2222**) is automatically calculated to the average value.



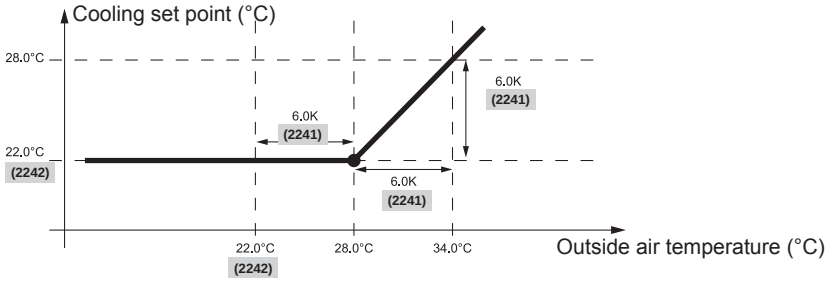
The cooling and heating thresholds can be specified according to the scheduling and can take different mode for each schedule mode (Night, Day, Day I, Day II and BMS).





2. Dynamic cooling set point

The CLIMATIC™ 60 determines the appropriate air set point according to the outside temperature in order to optimise the energy consumption. This function acts as a proportional shift of the cooling set point.

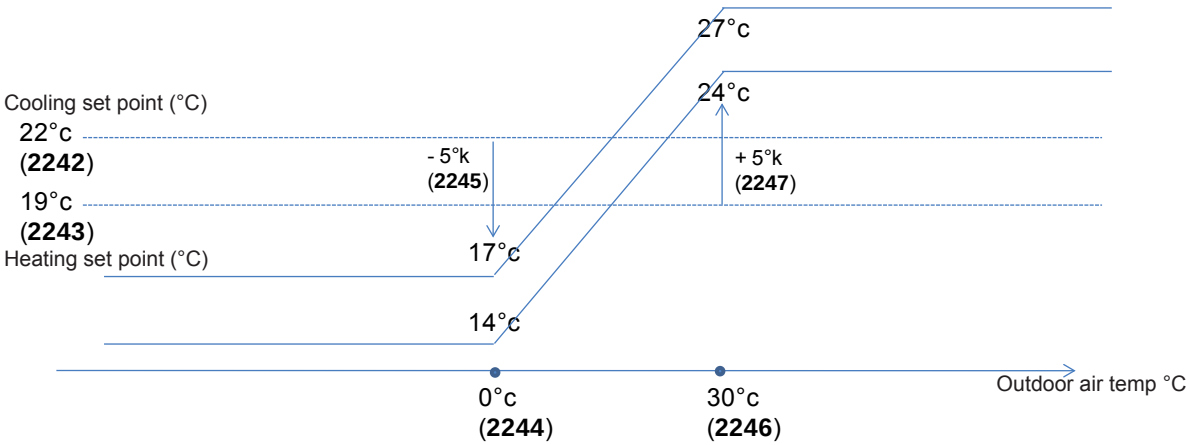


The dynamic set point starts to increase the cooling threshold when the outside temperature is over the cooling set point plus the dynamic set point.

Example:
The cooling threshold has been set to 22.0°C and the dynamic set point has been set to 6K.
The cooling threshold will start to drift when the outside air temperature will be ≥ 28.0°C (22.0+6.0) and the new threshold will follow the outside temperature evolution keeping a 6.0K difference.
So when the outside air temperature will reach 34.0°C, the new threshold will be 28.0°C.

3. Set point offset according to outside temperature

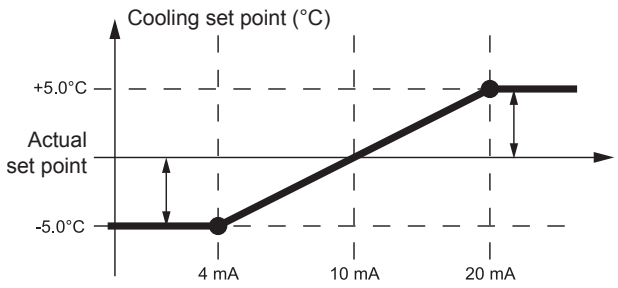
CLIMATIC™ 60 may offset the cooling and heating set points and so the dead zone according to the outside air temperature.

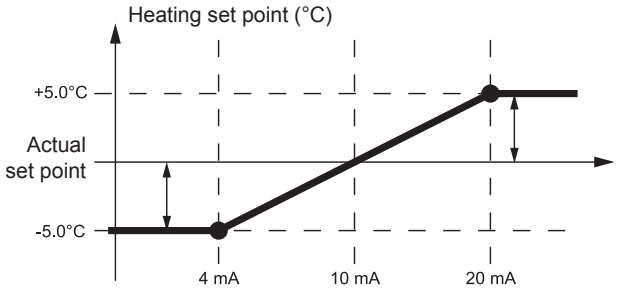


In the example above, setpoints (**2245**) and (**2247**) are set to -5k and +5k, from factory setting the are at 0k.

4. External current 4/20mA offset

In this case, the set point is set by one of the previous solution and can be adjust with an offset of +/- 5.0°C.





5. DC60 value

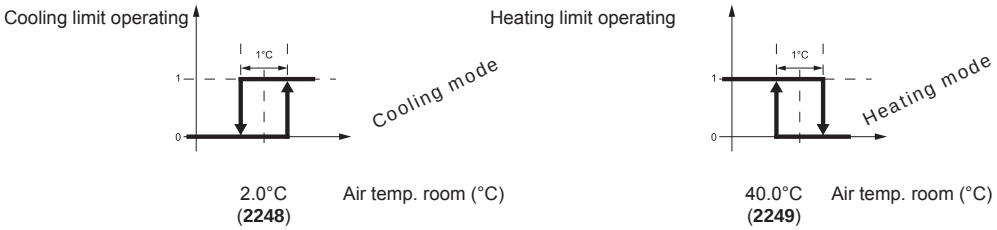
The CLIMATIC™ 60 receives the room set point from the DC60. If the read set point is different from the one calculated by the CLIMATIC™ 60, the new set point is set by the DC60 during the actual zone. Each time the zone is changing, the DC60 set point is overwritten by the CLIMATIC™ 60 set point.

6. BMS value

The CLIMATIC™ 60 receives the room set point from the BMS. Refers to the “BMS” paragraph for more details.

The control algorithm is protected by two safety limits.

- If the room temperature reaches the low limit in cooling mode, the compressor(s) are automatically stopped,
- If the room temperature reaches the high limit in heating mode, the compressor(s) or heaters are automatically stopped.



Settings

The different settings to adjust the ambient air temperature are available in the menus:

(2222):	customer (DC/DM) set point
(2241):	Dynamic set point (cooling setpoint offset according to outside temperature)
(**2242**):	set point of cooling mode
(**2243**):	set point of heating mode
(**2244**)	outdoor temperature low threshold for room temperature setpoint slope
(**2245**)	room temp setpoint offset according to low outdoor air temp
(**2246**)	outdoor temperature high threshold for slope on the room temperature setpoint
(**2247**)	room temp setpoint offset according to high outdoor air temp
(2248):	room temperature threshold for unloading cooling mode
(2249):	room temperature threshold for unloading heating mode
(**3221**)	offset for room temperature value

THERMOSTAT / HYGROSTAT CONTROL

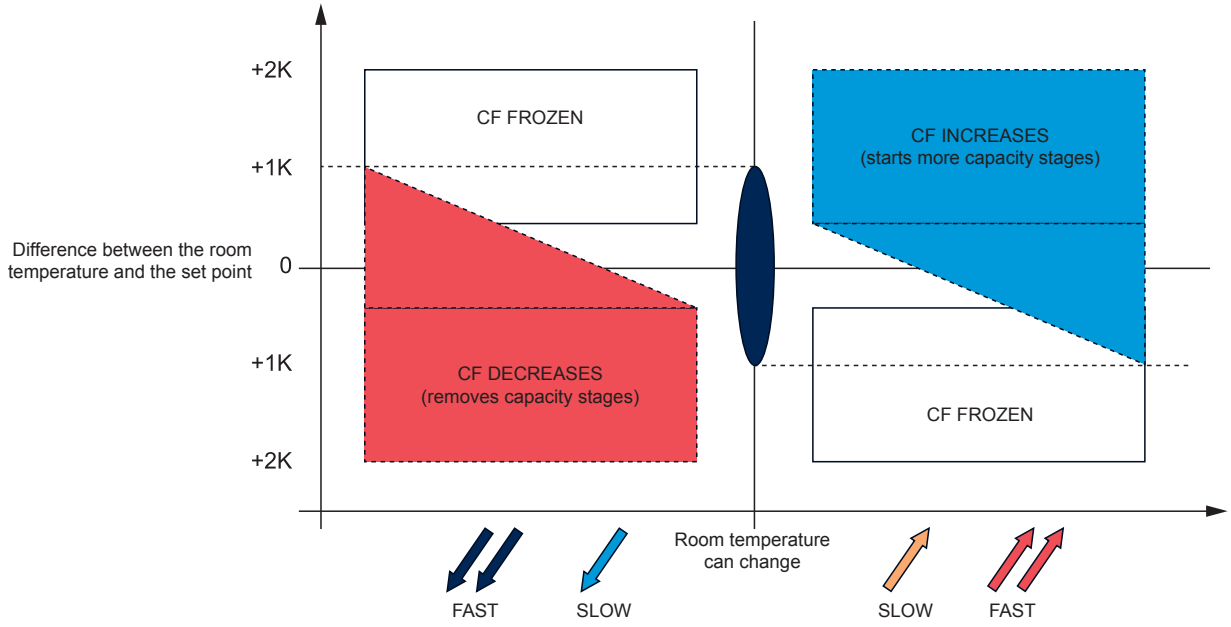
Function

The CLIMATIC™ 60 is controlling the heating and cooling staging according to the gap between measured temperature(s) and set point(s) and depending of the settings of the controller.

Control of the the room temperature

Description

The CLIMATIC™ 60 adjusts and holds the room air temperature as close as possible to the set point, by controlling the number of compressor stages, depending on the thermal load of the system. The controller constantly calculates the required capacity to reach the temperature set point. This variable is called “CAPACITY FACTOR” (CF) and its value can vary from 0 to 100%.



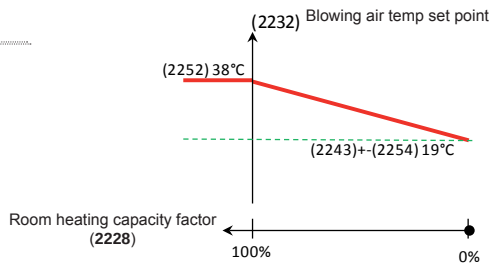
In order to anticipate, the reference point is recalculated each time the difference between air temperature and set point reaches a minimum or a maximum.
CLIMATIC 60 is calculating two Capacity Factor, for the room temperature one for heating mode and another one for cooling mode. It is possible to act on the system reaction speed by modifying Integral time set points in (**3228**) for cooling mode and (**3229**) in heating mode. Increasing the integral time value will increase the time to react (slow-down).

In order to improve the management of stagging, those room temperature capacity factors will determine the blowing air temperature setting point following the rules hereunder:

In heating mode

Proportional rule between

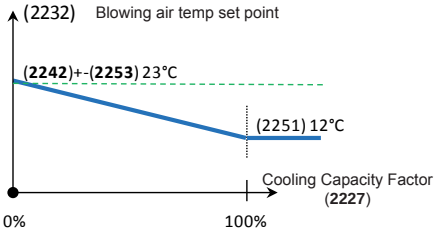
(CF) Heat	Blowing air temperature set point visible in menu (**2232**)
0%	Threshold : room temperature Heating set point (**2243**) + offset (**2254**)
100%	(**2252**)



Example
- If the Heating Capacity Factor (**2228**) is reaching 0% according to room temperature heating set point (**2243**), measured room temperature and integral time (**3229**),
- then the calculated blowing air temperature set point (**2232**), will be equal to the room temperature heating set point (**2243**) + offset for low limit threshold in heating mode (**2254**).

In cooling mode
Proportional rule between

CF Cool	Blowing air temperature set point visible in menu (**2232**)
0%	Threshold : room temperature Cooling set point (**2242**) + (**2253**)
100%	(**2251**)



Example
- If the Cooling Capacity Factor (**2227**) is reaching 100% according to room temperature cooling set point (**2242**), measured room temperature and integral time (**3228**),
- then the calculated blowing air temperature set point (**2232**), will be equal to the low limit threshold in cooling mode (**2251**).

In dead zone

CF Heat	CF Cool	Blowing air temperature set point visible in menu (**2232**)
0%	0%	Outside air temperature, limited by Threshold of room temperature Heating set point and Threshold of room temperature Cooling set point.

The various components of the roof top are then stagging according to a priority level and with a capacity factor calculated from the measured blowing air temperature and the blowing air temperature set point calculated as above.

In the CLIMATIC™60 there are 7 capacity factors calculated for the blowing air :

1. Damper for Free-Heating
2. Compressors in heating mode (Heat pump)
3. 1st Additional heaters (Gas, Elec. or Water)
4. 2nd Additional heaters (Elec. or Water)
5. Damper for Free-Cooling
6. Compressors in cooling mode
7. Chilled water

The controller is calculating for the seven components the necessary capacity to reach the temperature set point. It is directly linked to the number of control stages of the unit. Thus for a unit with 4 stages of regulation, the CF will start and stop a stage with the following values: ~0-25-50-75-100%
Each capacity factor is linked to an integral time allowing to act on the reaction speed.

Settings

The different settings to adjust the air room temperature control are available in the menus:

(**2251**):	low limit threshold in cooling mode
(**2252**):	high limit threshold in heating mode
(**2253**):	offset for high limit threshold in cooling mode
(**2254**):	offset for low limit threshold in heating mode
(**3228**)	integral time control for cooling mode
(**3229**)	integral time control for heating mode
(**3435**)	integral time control, compressor in cooling mode
(**3445**)	integral time control, compressor in heating mode
(**3735**)	1st heaters, integral time control
(**3738**)	2nd heaters, integral time control
(**3823**)	integral time control fresh air damper
(**3913**)	integral time control, chilled water

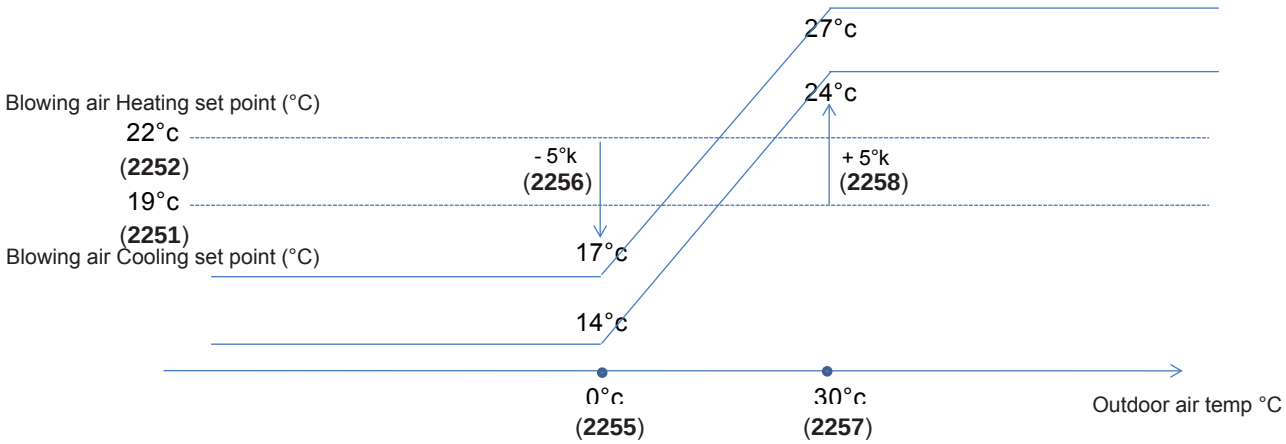
Control of the the Blowing air temperature

Description

In some application it may be interesting to control only the blowing air temperature, without controlling the room air temperature.

This function may be activated using menu (**3211**) and in this case, the various components of the roof topp are then stagging according to a priority level and with a capacity factor calculated from the measured blowing air temperature and the blowing air temperature set point which is then set by the users in menus (**2251**) et (**2252**).

additionnaly, as in the set point offset according to outside temperature, the CLIMATIC™ 60 may offset the cooling and heating set points and so the dead zone according to the outside air temperature.



In the example above, setpoints (**2256**) and (**2258**) are set to -5k and +5k, from factory setting the are at 0k.

Settings

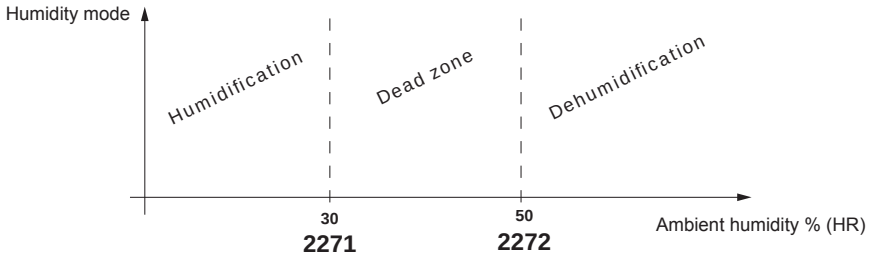
The different settings to adjust the blowing air temperature control are available in the menus:

(**2251**):	low limit threshold in cooling mode
(**2252**):	high limit threshold in heating mode
(**2255**):	outdoor temperature low threshold for slope on the supply temperature setpoint
(**2256**):	coefficient of the low outside temperature for the slope of the supply temperature setpoint
(**2257**)	outdoor temperature high threshold for slope on the supply temperature setpoint
(**2258**)	coefficient of the high outside temperature for the slope of the supply temperature setpoint
(**3211**)	choice of the control (room temperature or supply)

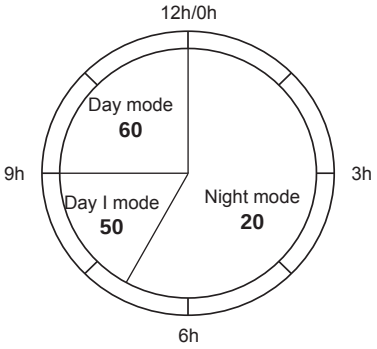
HUMIDITY SET POINT (OPTION)

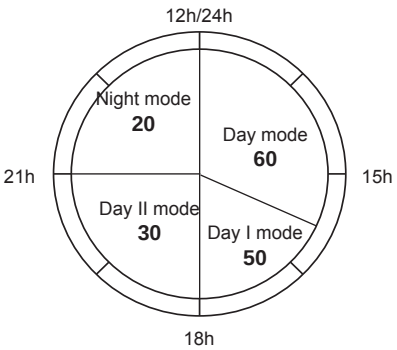
Function
The CLIMATIC™ 60 offers in option, the possibility to manage the relative humidity. The controller is programmed to maintain an humidity as comfortable as possible with the most economic usage of the unit.

Description
The relative humidity is maintained between 2 thresholds (a minimum threshold corresponding to the point of humidification and a maximum threshold corresponding to the point of dehumidification).



The dehumidification is ensured by the compressors in cooling mode or during the dead zone. Note that the priority is given to the control of the room temperature before the control of the room humidity.
The humidification is ensured by a 0/10V signal controlled by a PI algorithm.
The humidification and deshumidification thresholds can be specified according to the scheduling and can take different mode for each schedule mode (Night, Day, Day I, Day II and BMS).





Settings
The different settings to adjust the flow control are available in the menu:

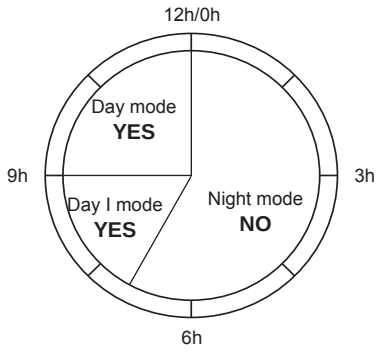
(2271):	set point of dehumidification
(2272):	set point of humidification
(**3244**):	integral time control for dehumidification
(**3245**):	integral time control for humidification

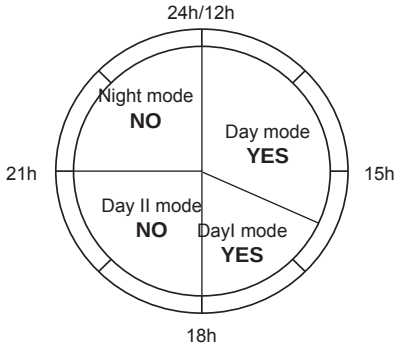
BLOWER

Function
The CLIMATIC™ 60 manages the main supply fan with a variable speed transmission.

Description
The supply blower is controlled by a variable speed inverter which offers various avantages:
- Soft start and stop of the blower,
- Speed reduction during the dead zone to optimise the energy consumption,
- Automatic speed control according to the desired airflow.

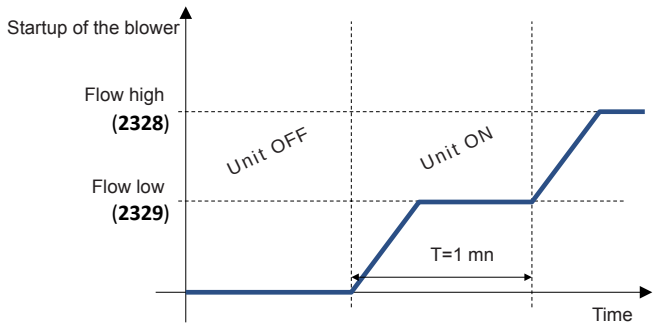
The supply blower activation can be specified according to the scheduling and can take different mode for each schedule mode (Night, Day, Day I, Day II and BMS)
- in the menu (**2316**) define the start of stop status of the fan.
- in the menu (**2317**) define the start of stop status of the fan during the dead zone as well (cooling / heating mode).





The control of the blower is configurable according to three modes with the setting (**2327**):
- "Standard": The fan is progressively set to the nominal air flow desired when the unit is switch ON.

When the unit is starting, the fan speed is increased progressively to reach the low speed set point value (**2329**). 1 mn later the fan speed is again increased progressively to reach the nominal set point value (**2328**).



- “Dead zone”: if the unit is in dead zone, the fan speed is set to the low speed set point value (**2329**). Acceleration and deceleration are done progressively.

- “Part load”: the fan is controlled according to the cooling / heating capacity. if the unit is in dead zone, the fan speed is set to the low speed set point value (**2329**). If the control is asking for heating or cooling, the fan speed is proportionnally set to the nominal speed (**2328**).
  This mode is avaible only in room temperature control mode. In case of blowing air temperature control, this mode cannot be activated.

In addition, in the 3 speed control mode above, the air flow control can be done in 2 different way according to the setting of the menu (**3332**).

- "Manual": The airflows are expressed as a percentage of the maximum speed. No variation are applied the speeds stay where they have been set.
- "Auto": The airflows are expressed in m^3/h. the fan speed is controlled to have its value (**2326**) reaching the required set point. With this mode it is possible to get a constant air flow whatever happen to the duct pressure losses or the filter ...

For the units with economizer, the set point (**3335**) allow to compensate the air flow (speed) according to the opening of the fresh air damper (to take into account the pressure losses of the return air ducting network)

- At 100% fresh air, the speed is according to nominal threshold (**2328**) or low speed threshold (**2329**)
- At 0% fresh air, the speed is taking in account the compensation (**3335**).

The fan speed is limited according to the kit (motor + fan) defined in set points (**3336**) et (**3337**).

- "Minimum": minimum fan speed,
- "Maximum": maximum fan speed

Settings

The different settings to adjust the blower set points are available in the menu:

(2316):	setpoint for activation operation of component
(2317):	setpoint for activation operation in room control dead zone
(**2318**):	temperature threshold for activation night refreshment function
(**2327**):	choice of speed function
(**2328**):	nominal threshold for air flow control
(**3334**):	low threshold for air flow control
(**3331**):	choice of functionality
(**3335**):	coefficient for compensation of losses of the air damper
(**3336**):	minimum threshold for air flow control
(**3337**):	maximum threshold for air flow control

COMPRESSOR

Function

The CLIMATIC™ 60 manages the compressor(s) according to the room air temperature demand and engages the number of compressor calculated to reach the ambient set point.

Description

The CLIMATIC™ 60 offers possibilities to disable all compressors of the unit in the menu (**2471**). This setting disables definitely all compressors in the select mode (Night, Day, Day I, Day II and BMS).

Setting (**2471**)	Compressor authorization (2 circuits with 2 compressors)
NO	
YES	

The same strategy can be applied according to the changeover mode in the menu (**2481**) (cooling) and (**2491**) (heating).

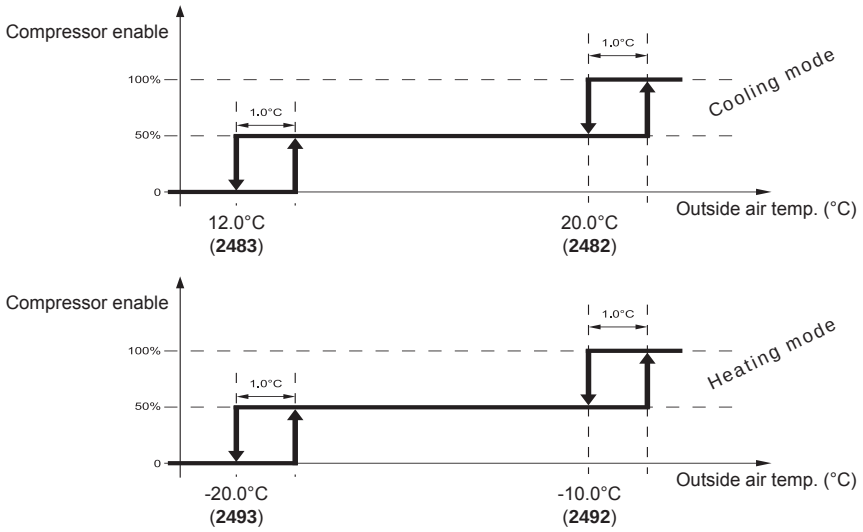
Setting (**2481**)	Compressor authorization (2 circuits with 2 compressors)
NO	
YES	

Setting (**2491**)	Compressor authorization (2 circuits with 2 compressors)
NO	
YES	

Moreover the compressor(s) can also be disabling separately on the circuit - circuit 1 (**2472**) circuit 2 (**2473**) - Note this opportunity can also be done by dry contact (refer to the “free input/output” paragraph).

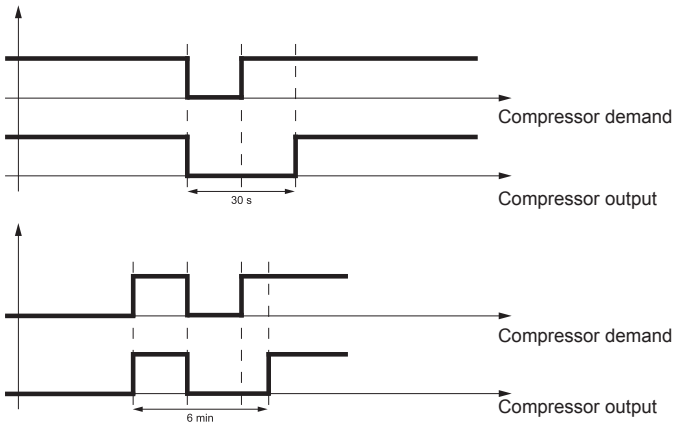
Setting (**2472**) - (**2473**)	Compressor authorization (Circuit with 2 compressors)
0	
1	
2	
3	

The outside air temperature can also be used to disable automatically the compressor. There are up to 2 thresholds to unload 50% or 100% of compressors on the unit.



The compressor is subject to various operating time in order to prevent from damage operating.

- The minimum OFF time of the compressor is fixed to 30 s,
- The minimum between 2 starts of the same compressor is fixed to 6 minutes.



Settings

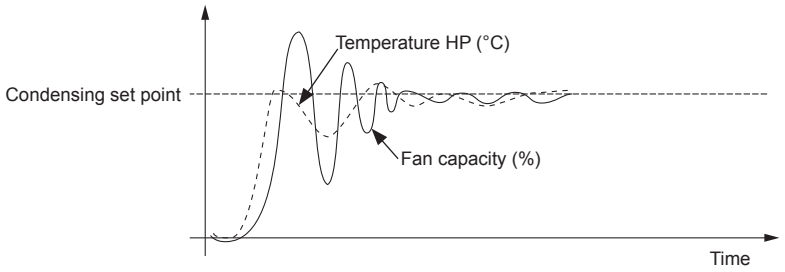
The different settings to configure the compressors are available in the menu:

(**2471**):	setpoint for activation operation of all compressor, cooling/heating mode
(**2472**):	enable circuit 1, separate comp.1 or/and comp.2
(**2473**):	enable circuit 2, separate comp.1 or/and comp.2
(**2481**):	setpoint for activation operation in cooling mode
(**2591**):	setpoint for activation operation in heating mode
(**2482**):	outside temperature threshold, unload 50% of compressors
(**2483**):	outside temperature threshold, unload 100% of compressors
(**2492**):	outside temperature threshold, unload 50% of compressors
(**2493**):	outside temperature threshold, unload 100% of compressors

CONDENSER FAN

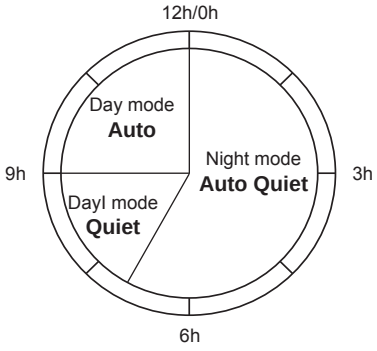
Function
The CLIMATIC™ 60 is used to maintain the high pressure as stable as possible in order to increase the performance of the unit.

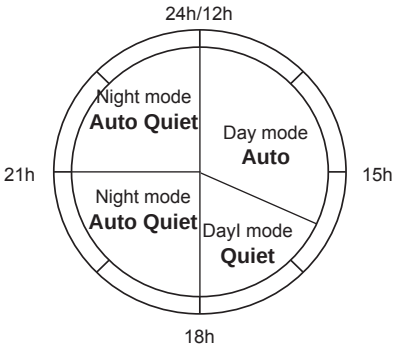
Description
The CLIMATIC™ 60 uses a PI algorithm to command fan stages or a speed inverter, depending on the unit type.

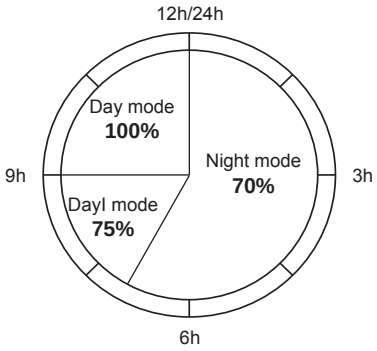


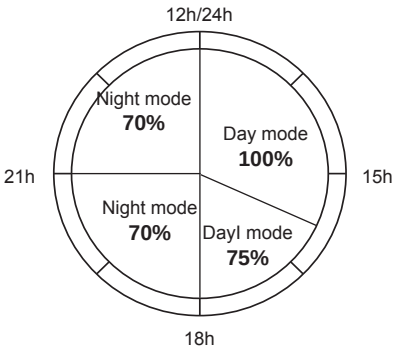
Moreover, for units with variable speed fans (option), the CLIMATIC™ 60 controls the fan speed limit which allows progressive adaptation of the unit to the building load and reduces the noise level - See hereunder operation of «Quiet» and «Auto Quiet»
It also exists a "Fixed " mode where the fan speed is adjusted to the set point (**3523**) .

The maximum speed and the fan management can be adjusted according to the schedule mode in order to benefit from the different fan control types in heating or cooling.



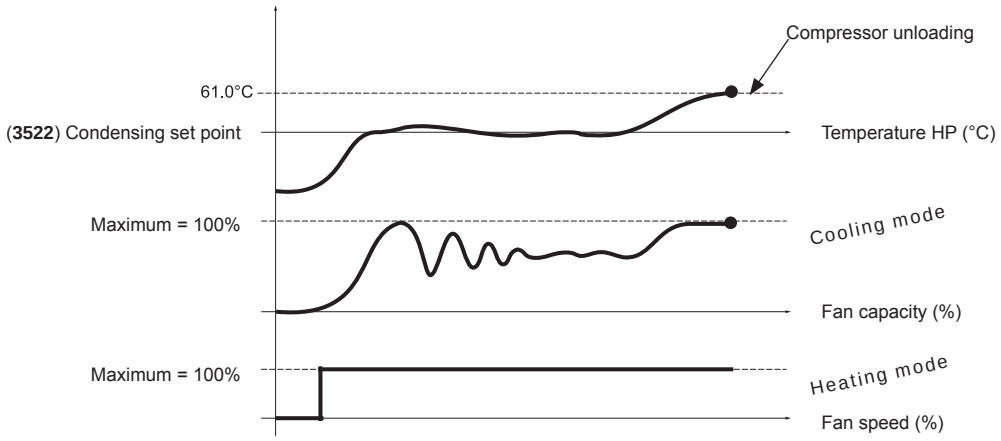




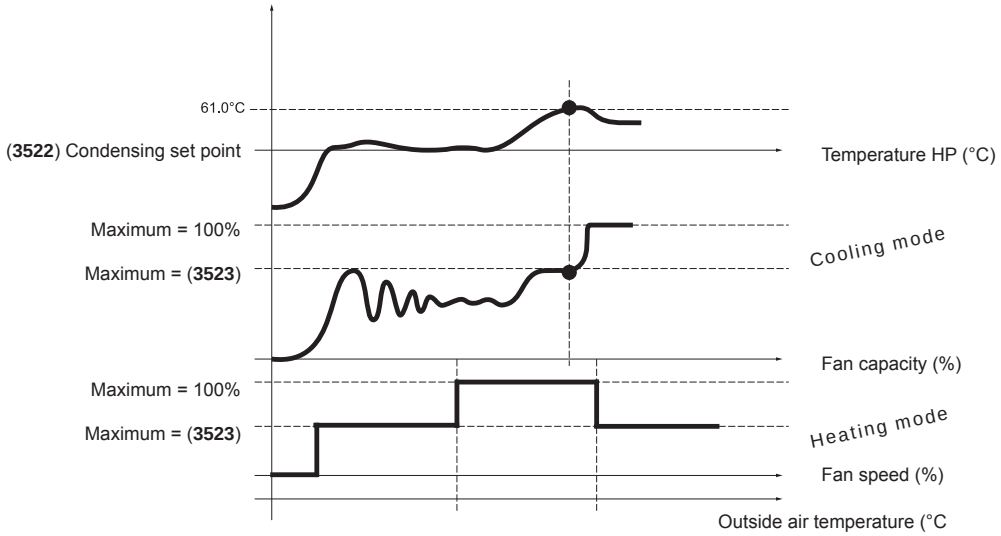


The acoustic mode offers 4 possibilities to manage the condenser fan in the menu (**3521**):

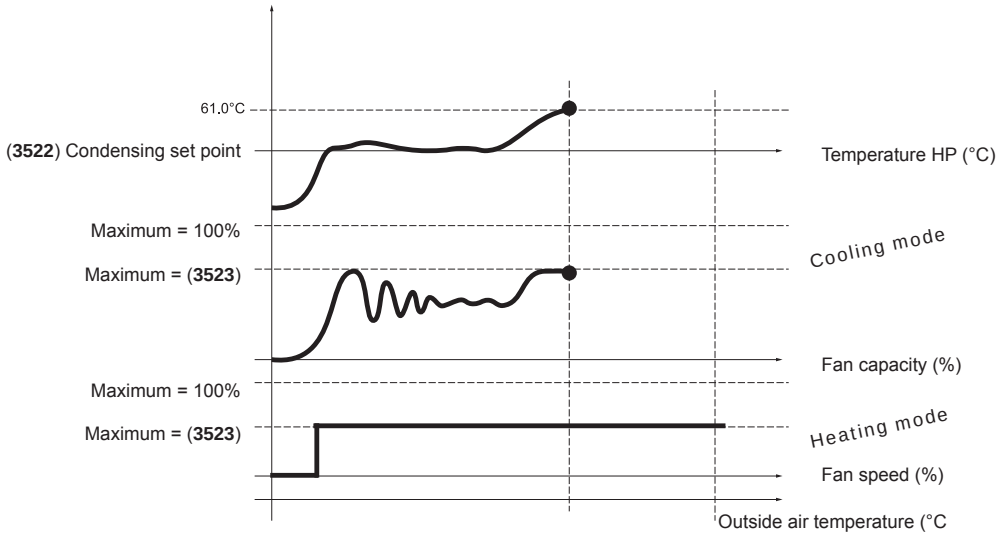
1. "Auto":
In this mode, the fan capacity is not limited and can go up to the maximal speed.



2. Quiet":
In this mode, the fan speed is limited according to the maximum set in the menu (**3523**). In case of too high condensing temperature, the CLIMATIC™ 60 unlocks this limit to prevent from unloading compressor.



3. Auto Quiet":
This mode is similar to the "Quiet" mode except that the fan speed limit is never unlocked. In case of high condensing temperature the CLIMATIC™ 60 will unload a compressor to prevent from HP cut.

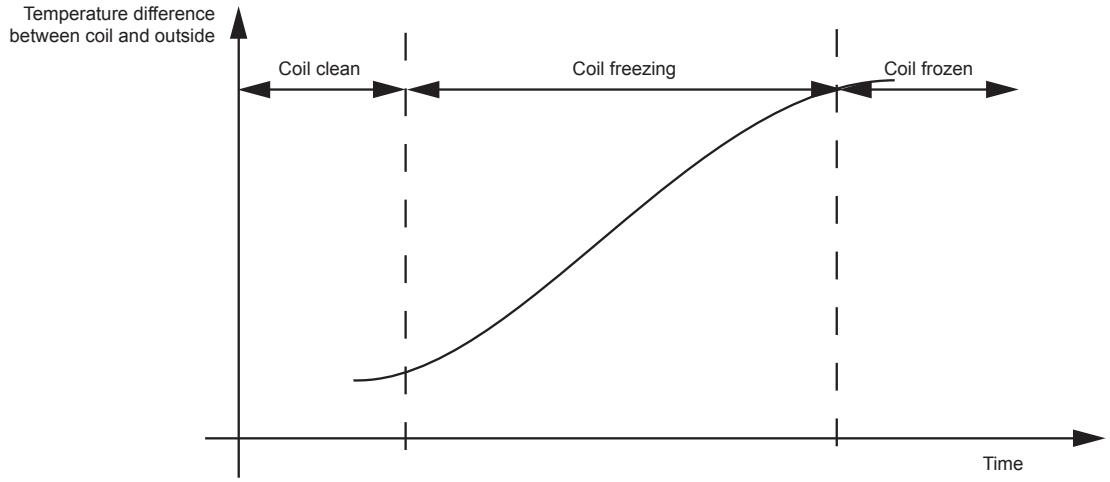


3. Auto Quiet":
In this mode, the fan speed is adjusted to the set point value (**3523**).

COIL DEFROST

Function
The CLIMATIC™ 60 manages defrost procédure to avoid ice on the evaporator coil in heating mode (winter season).

Description
To avoid icing of the external air exchanger during winter operating, it's necessary to reverse the refrigerant cycle. The dynamic defrost allows the unit to start the defrost procédure only when the coil is frozen. This achieves through the measurement of the temperature between the coil and the outside air.



The defrost procédure is activated if the following conditions are met during 1 minute:
- the outside air temperature is ≤ (**3541**),
- one of the compressor(s) on the circuit has been running for a time ≥ (**3543**) since the last defrost,
- the saturated temperature ratio is ≤ (**3542**).

The defrost procédure is characterized by the following steps:
1. start electrical heater during 2 min (rooftop with electrical heater only),
2. stop the compressors on the concerned circuit,
3. wait for 5 s
4. reverse the 4WV
5. start all compressors on the circuit (if the blowing T° is not too low),
6. start all condenser fans when the HP ≥ 50.0°C,
7. stop all condenser fans when the HP ≤ 42.0°C,
8. repeat the steps 6. to 7. N times (N is configurable in the menu (**3544**), 3 from factory setting)
9. stop the compressors of the circuit,
10. wait for 1 min to equalise the pressure in the circuit,
11. start the fans 30s to dry the condensenser
12. end of procedure; restart the unit in heating mode.
13. reverse the reversing valve after 5 s if ΔP>2 bar.

In menu (**3545**), it is possible to start only one compressor per circuit with tandem during the defrost.

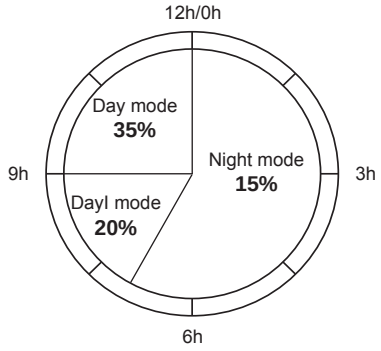
FRESH AIR DAMPER

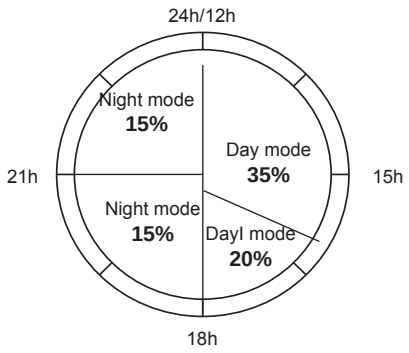
Function
Ensure a minimum fresh air introduction into the room and/or a free-cooling, free-heating, thus reducing electric consumption.

Description

Fresh air setting

Adjustement by setpoint
The fresh air rate is adjustable by set point for each schedule mode (Night, Day, Day I, Day II BMS)
2823 → Minimum opening of the fresh air damper, %, adjustment by zone.





It is also possible to set a maximum fresh air thresholdin set point (**3822**).

Adjustement by free contacts (Optional)
With the customized free contacts, the fresh air rate can be adjusted (See Customized Input / Output (BE.60))
- Contact closed on [No F.A], the unit will close completely the fresh air damper.
- Contact closed on [All F.A], the unit will open completely the fresh air damper.
- Contact closed on [x% F.A.], the unit will open the damper to x%.

If several contacts customized with this functionality are closed, the fresh air damper will open according to the sum value of all closed contacts. In any case, the minimum fresh air rate will be fixed according to the highest value between the set point and the free contacts request.

Adjustement by external signal (Optional)
The minimum fresh air can be remotely modified by a 4-20mA signal (See Customized Input / Output (BE.60))
For a 4mA signal of, the threshold is set to 0%, for a 20mA signal, it is set to 100%, a linear rule is applied in between.

Fresh air damper calibration
The real fresh air volume introduced into the system is not always proportional to the damper opening percentage, particularly when the return air duct system is sized to give excessive pressure losses.
This may result with excessive fresh air input, and thus with an increase of the system exploitation costs.

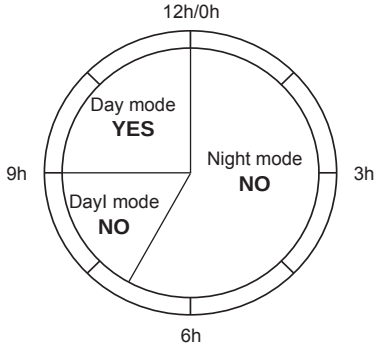
In the menu (**3825**), it is possible to enable the fresh air calibration which is then performed by measuring temperature of blowing air, return air and outside air.

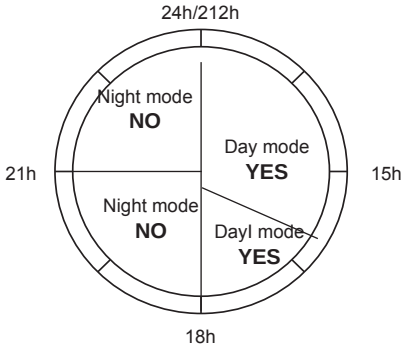
The CLIMATIC™ 60 calculates and stores the exact percentage of fresh air for each damper position.
This sequence takes place periodically when all heating and cooling elements are off.

CO^2 air quality sensor (optional)

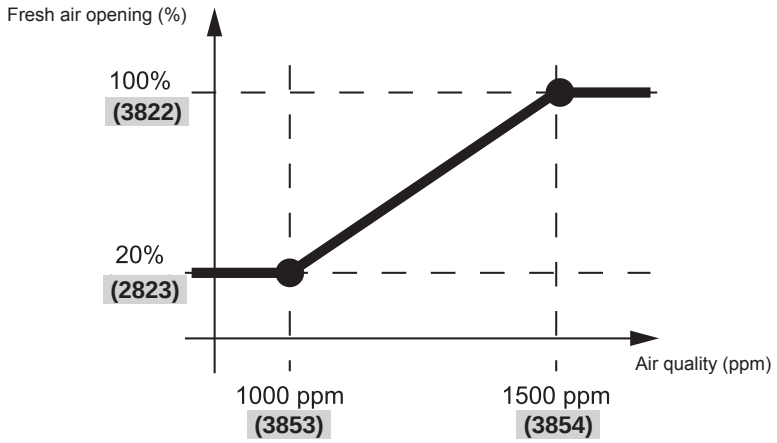
The CLIMATIC™ 60 offers a solution to optimise the air quality through to a CO^2 sensor.

The activation of the air quality control can be specified according to the scheduling and can take different value for each schedule mode (Night, Day, Day I, Day II and BMS) in the menu (**3851**).





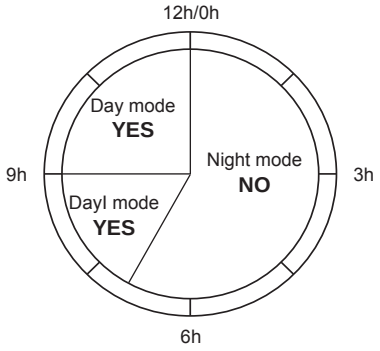
The CLIMATIC™ 60 controls the fresh air damper to maintain a fine air quality in the room place. The damper is moving from the minimum setting (**2823**) to the maximum setting (**3822**) according to the minimum air quality (**3853**) and the maximum air quality (**3854**). If the air quality reach a level set in (**3855**) the alarm is activated.

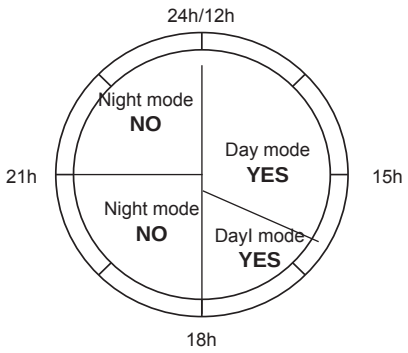


Free cooling - Free heating

From a room temperature need (Capacity Factor) the damper opens according to a proportional rule on the blowing temperature, 0% need = Minimum fresh air (**2823**) and 100% need = maximum opening threshold (**3822**)
The user may choose to limit the fresh air damper operation with contacts or set points modification (see § above). The outdoor temperature or humidity value may also limit the opening.

The free cooling or the free heating activation can be specified according to the scheduling and can take different mode for each schedule mode (Night, Day, Day I, Day II and BMS) in the menus (**3831**) and (**3841**).





Outdoor temperature
The free cooling and the free heating are also enabled according to the outside air temperature. There are 2 settings (**3832**) and (**3833**) for the free cooling and two settings (**3842**) and (**3843**) to define the start and stop temperature thresholds.

Outdoor humidity (Optional)
If humidity control option is selected, the Free-cooling is stopped if the external absolute humidity (water weight) is higher than the indoor absolute humidity

Free contact (Optional)
Stop of Free-Cooling by closing customized free contacts (see minimum fresh air § above).
[No FreeC] = This function is disabled.
- Contact closed on [No F.A], the unit will close completely the fresh air damper.
- Contact closed on [All F.A], the unit will open completely the fresh air damper.
- Contact closed on [No FreeC] or [No FreeH], the function is disabled.

Settings
The different settings to adjust the fresh air damper are available in the menu:

(2823):	set point of minimum fresh air
(3822):	set point of maximum fresh air
(**3825**):	state of calibration function
(**3831**):	setpoint for activation operation of function free cooling
(**3832**):	outside lower temperature threshold, unload free cooling
(**3833**):	outside upper temperature threshold, unload free cooling
(**3841**):	setpoint for activation operation of function free heating
(**3842**):	outside lower temperature threshold, unload free heating
(**3843**):	outside upper temperature threshold, unload free heating
(**3853**):	minimum threshold for control
(**3854**):	maximum threshold for control
(**3855**):	upper air quality threshold of alarm

EXHAUST (OPTION)

Function

The CLIMATIC™ 60 manage 2 different type of exhaust

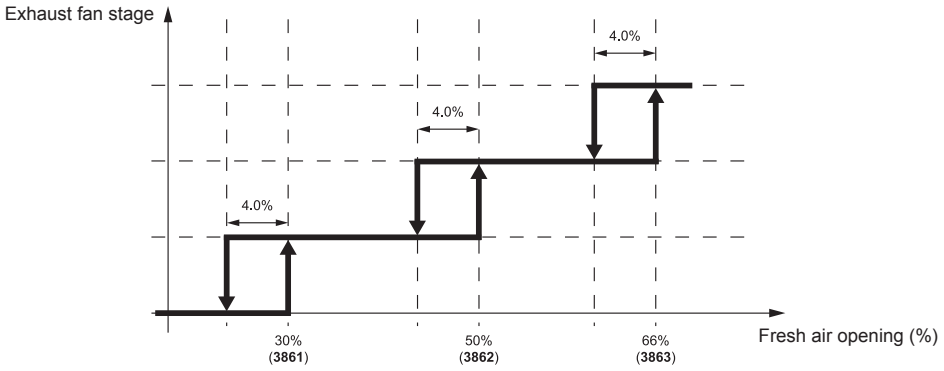
- A step control up to three exhaust fans to assure a good differential pressure between the supply and the return air. Starts and stops of these fans depend on the opening of the fresh air damper
- A continuous exhaust when the unit is equipped with a variable speed fan.

Description

Step control exhaust

The exhaust fan(s) are activated according to the fresh air opening pourcentage of the damper.

- if the fresh air opening ≥ (**3861**), the stage 1 is turned on,
- if the fresh air opening ≥ (**3862**), the stage 2 is turned on,
- if the fresh air opening ≥ (**3863**), the stage 3 is turned on.



Continuous exhaust fan

The exhaust fan is then working in parralel with the blower (see relative §) with a nominal air flow threshold (**3864**), a minimum air flow threshold (**3865**) and a coefficient to compensate the fresh air damper closing (**3866**).

Settings

The different settings to adjust the exhaust fan are available in the menu:

(3861):	opening percentage threshold of actuator for 1st fan
(3862):	opening percentage threshold of actuator for 2nd fan
(**3863**):	opening percentage threshold of actuator for 3rd fan
(**3864**):	nominal threshold for air flow control
(**3865**):	low threshold for air flow control
(**3866**):	coefficient for compensation of losses of the air damper

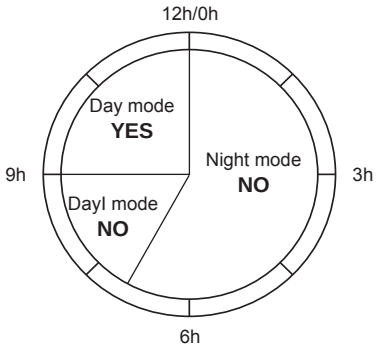
ENERGY RECOVERY (OPTION)

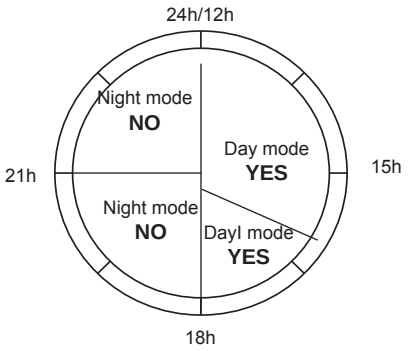
Function

The CLIMATIC™ 60 offers in option a solution to recover the energy of the exhaust air. There are 3 types of recovery:
- plate heat exchanger for BALTIC™ units,
- rotary wheel exchanger for FLEXY™ units.
- Thermodynamic heat recovery for BALTIC™ units

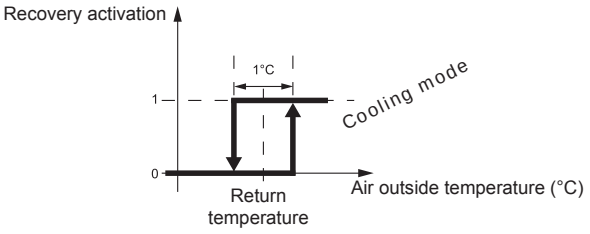
Description

The recovery activation can be specified according to the scheduling and can take different mode for each schedule mode (Night, Day, Day I, Day II and BMS) in the menu (**3871**).





The recovery control depends on mainly the outside air temperature. The recovery is activated if:
- outside temperature ≥ return air temperature in cooling mode,
- outside temperature ≤ return air temperature in heating mode.



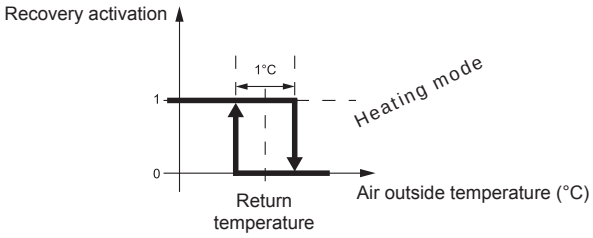


Plate heat exchangers - BALTIC™

For BALTIC™ units using plate heat exchangers, the CLIMATIC™ 60 activates the by-pass damper. It opens if the free-cooling is activated or to defrost the heat exchanger. The defrost is activated by a differential pressure switch installed in the module.
In order to defrost, the damper bypass is opened for 6 minutes. 15 operating minutes minimum are required between two defrosts.

Enthalpie wheel - FLEXY™

For FLEXY™ units using enthalpie wheel, the CLIMATIC™ 60 activates the wheel motor if |Outside air t° - return air t°| ≥ (**3872**)°K

If the outside air temperature is below the threshold (**3873**) the wheel is likely to icing; to avoid this phenomenon the motor is stopped 3 minutes every hour to defrost the wheel.

Thermodynamic heat recovery - BALTIC™

For BALTIC™ units using thermodynamic heat recovery, the compressor(s) dedicated to heat recovery is (are) managed as additional capacity stage(s).
So, the setpoints **3421**, **3431** and **3441** decribed in the COMPRESSOR § enables also these compressors.

However, the compressors assigned to heat recovery are activated only if the following conditions are met:
- The return air temperature is > 16°C
- The fresh air damper opening is > 22% .

Priority is then given to energy recovery compressors compared to other compressors whether the fresh air damper opening is> 50%.
Priority is then given to other compressors compared to the energy recovery compressors if the fresh air damper opening is <50%

EXTRA HEATING (OPTION)

Function

The CLIMATIC™ 60 can manage up to 3 types of supplement of heating according to the type of unit.

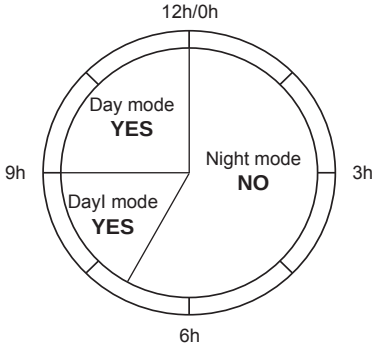
- gas,
- electrical heaters,
- hot water coils.

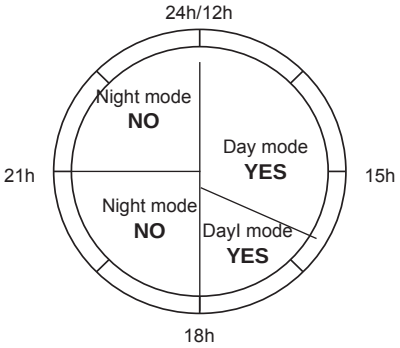
Description

The CLIMATIC™ 60 can control simultaneously 2 types of supplement of heating:

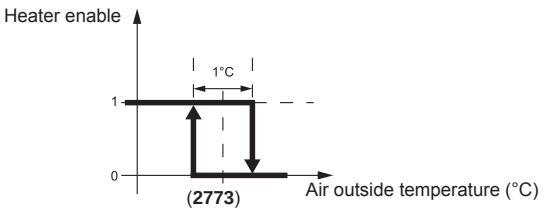
- heater 1: gas, electrical heaters, or hot water coils,
- heater 2: electrical heaters, or hot water recovery,

The heater (1 or 2) activation in the menus (**3721**) and (**3724**) can be adjusted according to the scheduling and can take different values for each schedule mode (Night, Day, Day I, Day II and BMS).





The supplement of heating is managed as an additional stage according to the outside temperature .

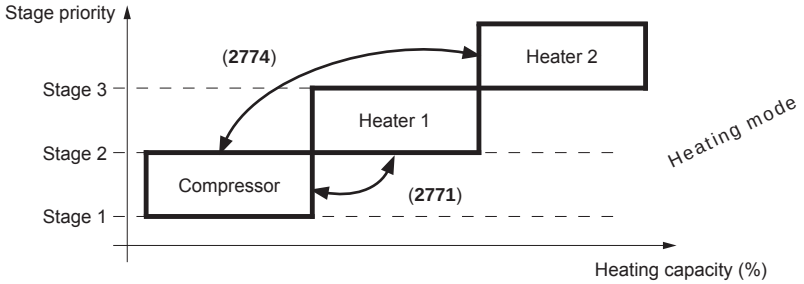


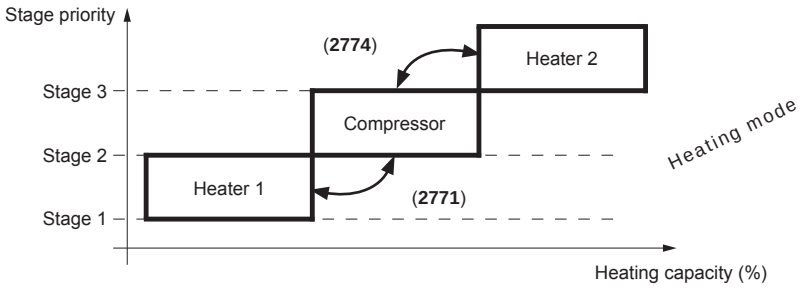
The priority between the compressor(s) and the heater(s) can be predefined in the menus (**2771**) and (**2774**).
The various posssiblities to sequence the heater 1 are:

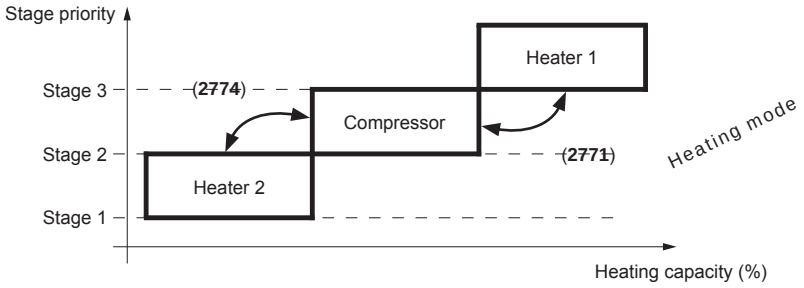
- (**2771**) = ”Never”: the compressor(s) are started first, then the heater 1, (by default)
- (**2771**) = ”Always”: the heater 1 is started first, then the compressor,
- (**2771**) = ”Out low”: the heater 1 is started first if the outside temperature is ≤ (**2772**), then the compressor,
- (**2771**) = ”Out high”: the heater 1 is started first if the outside temperature is ≥ (**2772**), then the compressor.

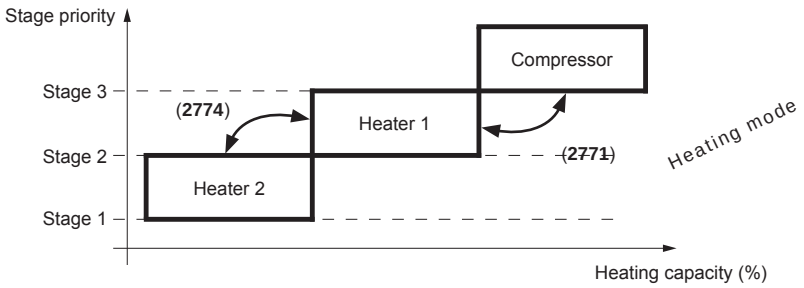
The various posssiblities to sequence the heater 2 are:

- (**2774**) = ”Last”: the compressor(s) are started first, then the heater 2, (by default)
- (**2774**) = ”First”: the heater 2 is started first, then the compressor.









Electrical heaters
The capacity of electrical heaters controlled piloted by Triac may be limited. The set point (**3751**) sets the maximum threshold

Hot water
Protection against freezing with minimum water flow - If the outside air temperature is below the set point (**3762**), the valve will open to a minimum set in the threshold (**3761**) .
Freezing fault
In general, in case of hot water coil icing détection, the valve will open to 100%. Due to certain hydraulic network, pumps or tracing, the coil protection is done by closing the valve. This can be activated with the set point (**3763)**.

Hot water circulator
The Climatic may drive a circulator for the hot water hydraulic circuit.

The circulator activation mode can be adjusted according to the circuit.in the menu (**3771**)

[Stopped]	No circulator
[Frost.Al]	Circulator activation in case of freezing fault
[Heat.Mode]	Circulator activation in heating mode for air temperature regulation
[Power On]	Circulator activation as soon as the blowing fan is activated

FREE INPUT/OUTPUT

Function

The CLIMATIC™ 60 has free input / output on the main board BM60 and the expansion board BE60 to offer different possibilities to customize input / output for remote control of the unit.

Description

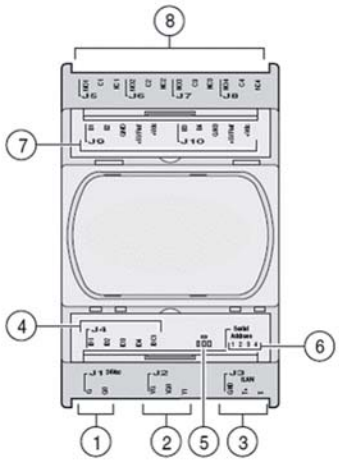
The free customized input / output number is:

- 2 free input contacts (normally opened) on BM60,
- 1 or 2 free output contact (normally opened) on BM60,
- 4 free input contacts (normally opened) on BE60,
- 4 free contacts (normally opened) output on BE60,
- 4 free analog inputs on BE60.

WARNING - Depending on the options ordered, all I / O configurable are not available. In the following Price List option code is indicated between brackets.
Ex (**DCBO**) Price list code of expansion card option

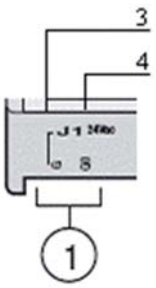
The expansion board BE60 is an additional board fixed on DIN rail. The description of the various connectors is:

1. power supply of the board,
2. analog output 0/10V: not used,
3. network bus to the CLIMATIC™ 60 BM60,
4. 4 digital inputs: dry contacts only,
5. LED status of the network bus,
6. serial address dip-switch of the network bus,
7. 4 analog inputs configurable by pair B1-B2 and B3-B4,
8. 4 digital outputs: dry contacts only.



Power supply

The expansion board BE60 is powered in 24Vac, +/-15%, 50-60Hz, Pmax=6W.



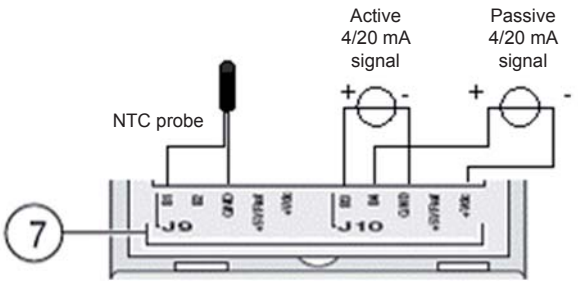
Analog input

The 4 analog inputs can be used as NTC probe (-50T90 °C; R/T 10 KΩ at 25 °C) or 4/20mA (Impedance = 100Ω) current signal. They are configurable by pair B1-B2 and B3-B4. The configuration of the type of the input is automatically set by the CLIMATIC™ 60.

- 0 input on the BM60
- 4 inputs on the BE60 dry contact board option (**DCBO**):

BE-J9-B1	not available if air quality sensor (**CO2S**). If Humidity sensor (**ADCP**), Ntc BMS isn't available.
BE-J9-B2	not available if humidity sensor (**ADCP**). If Air quality sensor (**CO2S**), Ntc BMS isn't available.
BE-J10-B3	not available if circuit leak détection (**RLKD**)
BE-J10-B4	if circuit leak détection (**RLKD**) only Ntc BMS is available.

Ntc Room	control, room temperature by NTC probe
Ntc BMS	BMS, temperature (NTC) reading for BMS
HR. BMS	BMS, relative humidity (4-20mA) reading for BMS
Sp Temp.	shift of the setpoint (4mA=-5K, 20mA=+5K)
Sp F.Air	fresh air set point, value (4mA=0%, 20mA=100%)
Sp Speed	speed blower set point, value (4mA=low level, 20mA=nominal level)
T. Out.	control, outside temperature by 4-20mA sensor
T. Room	control, room temperature by 4-20mA sensor
HR. Out.	control, outside relative humidity by 4-20mA sensor
HR. Room.	control, room relative humidity by 4-20mA sensor



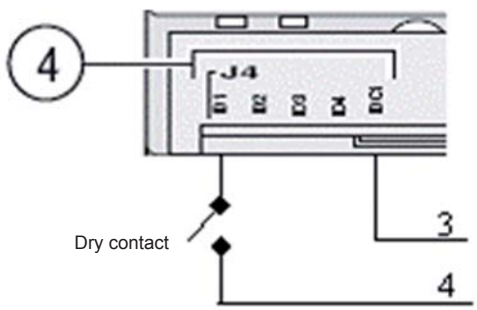
Digital input

The 6 digital inputs must be used with dry contacts according to the following example. The digital input can be configurated to be used as one of these items:

- 2 inputs on the BM60
  BM-J4-ID4, not available if electrical heaters on fresh air (**ELPS**)(**ELPH**).
  BM-J4-ID7, not available if static recovery module (**HRMO)**.
- 4 inputs on the BE60 Dry Contact Board option (**DCBO**)
  BE-J4-ID1, always available.
  BE-J4-ID2, always available.
  BE-J4-ID3, always available.
  BE-J4-ID4, not available if humidifier.

Note: These points are available by Dry Contact or by BMS request.

On/Off	Status of the request for unit (ON/OFF)
Reset Al	reset, alarm
Summer	control, unloaded heating mode
Winter	control, unloaded cooling mode
Low Fan	blower, force reduced flow (low speed)
High Fan	blower force nominal flow (high speed)
No F.A	fresh air, force the damper to close (0%)
10% F.A	fresh air, force the damper to minimum opening (10%)
20% F.A	fresh air, force the damper to minimum opening (20%)
30% F.A	fresh air, force the damper to minimum opening (30%)
40% F.A	fresh air, force the damper to minimum opening (40%)
50% F.A	fresh air, force the damper to minimum opening (50%)
All F.A	fresh air, force the damper to full opening (100%)
No FreeC	fresh air, unloaded Free-Cooling mode
No FreeH	fresh air, unloaded free-heating mode
No Air.Q	air quality, unloaded control
Defrost	circuit, defrosting cycle delayed (compressor)
50% Cp.	circuit, unloaded immediately 50% of compressors running
No Comp.	circuit unloaded all compressor
No HPump	circuit, unloaded all compressor in heat-pump mode
No Cp&Ht	circuit and heaters, unloaded all
50% Ht.	heaters, unloaded immediately 50% of heaters running
No Heat.	heaters, unloaded all heaters
Prio.Ht.	control, force the priority of the heaters vs compressors
TCB G	TCB, G
TCB B	TCB, B
TCB Y1	TCB, W1
TCB Y2	TCB, W2
TCB W1	TCB, Y1
TCB W2	TCB, Y2
for BMS	BMS, input reading for BMS
M. DayII	schedule, force the DayII mode
M. DayI	schedule, force the DayI mode
M. Day	schedule, force the Day mode
M. Night	schedule, force the Night mode
M. BMS	schedule, force the BMS mode



Digital output
The digital outputs are dry contacts and the maximum commutable power is 2000VA, 250Vac.

The digital output can be configurated to be used as one of these items:

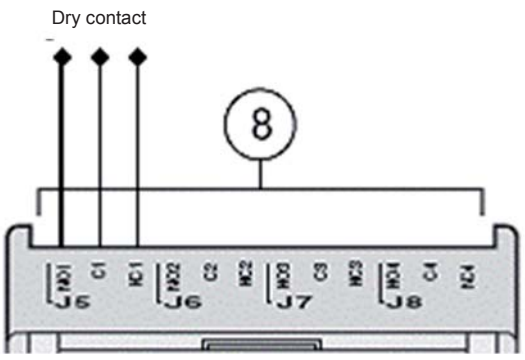
- 2 relays on the BM60

BM_J14-NO7	not available if 2 steps of electrical heaters (**ELHS**)(**ELHH**) or gas burner units BAG, BAM, FGA, FDA.
BM_J15-NO12	not available if size 24 to 42. (C-Box)

- 4 relays on the BE60 dry contact board option (**DCBO**)

BE-J5-NO1	not available if exhaust fan (**PEFA**)
BE-J6-NO2	always available.
BE-J7-NO3	always available.
BE-J8-NO4	not available if humidifier.

Alarm	alarm, general
Minor A	alarm, minor
Major A	alarm, major
Filter A	alarm, dirty filters or missing
Blower A	alarm, blower
Comp. A	alarm, circuit (compressor)
Gas A	alarm, gas burner
Elec. A	alarm, electrical heaters
Frost. A	alarm, supply temperature too low (freeze protection)
Smoke A	alarm, smoke détection
Power	On / OFF status
Defrost	circuit, defrosting cycle requested or activated (compressor)
Heating	control, heating mode activated
Dead Z.	control, dead zone mode activated
Cooling	control, cooling mode activated
by BMS	BMS, activated by BMS
M. DayII	schedule, DayII mode activated
M. DayI	schedule, DayI mode activated
M. Day	schedule, Day mode activated
M. Night	schedule, Night mode activated
M. BMS	schedule, Mode BMS activated
Sched.Z0	schedule, zone 0 activated
Sched.Z1	schedule, zone 1 activated
Sched.Z2	schedule, zone 2 activated
Sched.Z3	schedule, zone 3 activated
Sched.Z4	schedule, zone 4 activated
Sched.Z5	schedule, zone 5 activated
Sched.Z6	schedule, zone 6 activated



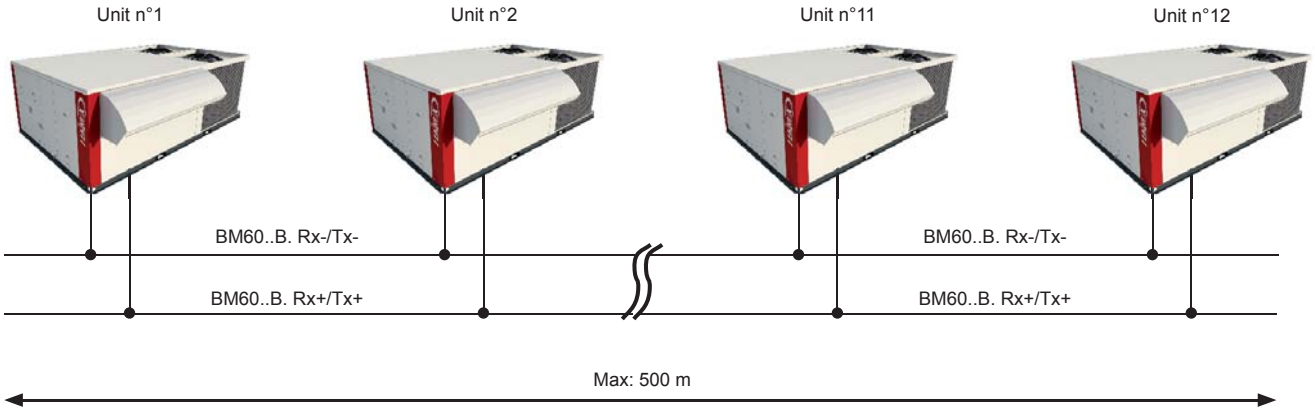
Settings
The different settings to configure the custom I/O are available in the menus:

(**3121**):	setting of functionality for relay bm n7
(**3122**):	setting of functionality for relay bm n12
(**3123**):	setting of functionality for relay be-1 n1
(**3124**):	setting of functionality for relay be-1 n2
(**3125**):	setting of functionality for relay be-1 n3
(**3126**):	setting of functionality for relay be-1 n4
(**3131**):	setting of functionality for digital input bm id4
(**3143**):	setting of functionality for digital input bm id7
(**3133**):	setting of functionality for digital input be-1 id1
(**3134**):	setting of functionality for digital input be-1 id2
(**3135**):	setting of functionality for digital input be-1 id3
(**3136**):	setting of functionality for digital input be-1 id4
(**3141**):	setting of functionality for analog input be-1 b1
(**3142**):	setting of functionality for analog input be-1 b2
(**3143**):	setting of functionality for analog input be-1 b3
(**3144**):	setting of functionality for analog input be-1 b4

MASTER / SLAVE

Function

The CLIMATIC™ 60 offers possibilities to connect up to 24 units to allow relationship between each unit in order to perform the system.



The pLAN bus is connected to CLIMATIC™ 60 on the J8 connector of board BM60. A star connection is not recommended. For an optimum operation it is advised to connect a maximum of two cables per unit.
The cable length should not exceed 500 m and must use a 2 pairs with general shield like LiYCY-P (0.34 mm²).

Description

There are 4 different modes to manage the units:
- Cool / Heat,
- token,
- backup,
- backup revolving.

Cool / Heat mode

In this mode, all units are running in stand-alone, but the changover mode is fixed by the master unit.
- if the master request for cooling air, the slave units can't run in heating mode,
- if the master request for heating air, the slave units can't run in cooling mode.

The token mode

This mode limits the number of compressor(s) in operation. The setting (**3174**) defines the maximum number of compressor(s) running simultaneously for all the units connected.

The backup mode

it is used to help the system in case of alarm(s) on the running unit. The unit in standby will start only if one of the other running unit(s) is in alarm. In that case the unit in alarm will be stopped and replaced by the one which was in standby.

The backup revolving mode

This mode is similar to the "backup mode", but the CLIMATIC™ 60 manages also the rotation between the units declared every Tuesday at 9h00.

Reference set point

For all these modes, the room temperature set point of the slaves unit(s) can be adjusted as well as the master unit set point. In this way when the set point is modified by the DC60 connected to the master, all slaves units will receive the new set point. The activation of this Function is avaible in the menu (**3176**).

The CLIMATIC™ 60 offers various solutions to optimise the control, by fixing a reference temperature, humidity and CO_2 .The ambient and outside temperatures, the external air humidity and the CO_2 air quality can be synthesized to obtain a reference value, used for the control, (**3177**) to (**3179**). There are up to 3 modes to manage the probes / sensors in master / slave connection:
- "not used": all units run according to their own probes / sensors,
- "master": all units run according to the master probes / sensors,
- "average": all units run according to the average of the probes / sensors of all units connected.

DS60 DISPLAY

Function

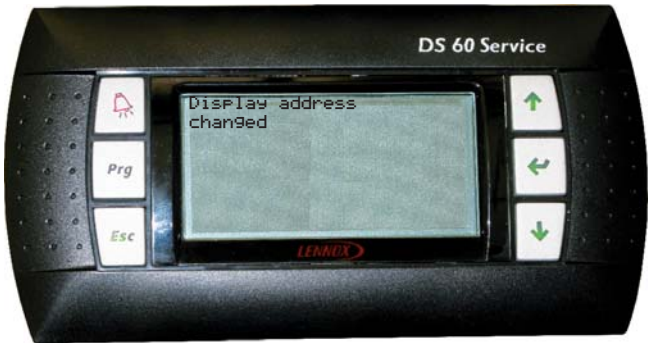
The DS60 terminal is a plug and play display, designed for maintenance and service people who want to access to advanced functionalities.

Description

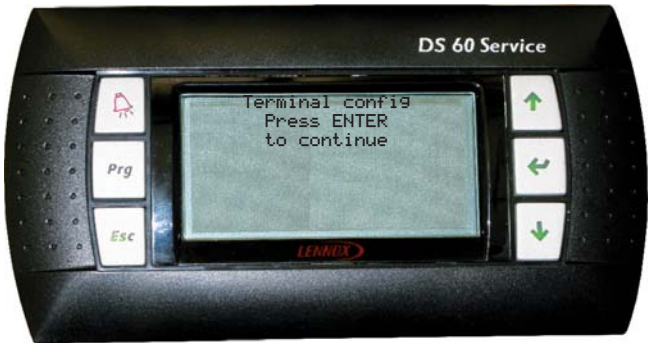
The terminal address must be assigned to establish the communication with the CLIMATIC™ 60. The procédure to configure the DS60 is:

1. Press the buttons "↓", "↑", "←" keys at the same time during 5 seconds,
2. Use the "←" key to move the cursor on the address number,
3. Use the "↓", "↑" keys to select the value "32" for the DS60 (or DS50) and confirm with the "←" key (The cursor go directly to the next data).

4. If the address has been modified, the next screen is displayed. In that case restart step 1.



5. Use the "↓", "↑" keys to select the desired address of CLIMATIC™ 60. CLIMATIC™ 60 address must be at the address "1" except if there is several units linked. The next screen is displayed.



6. Press the "←" key to go to the next step.

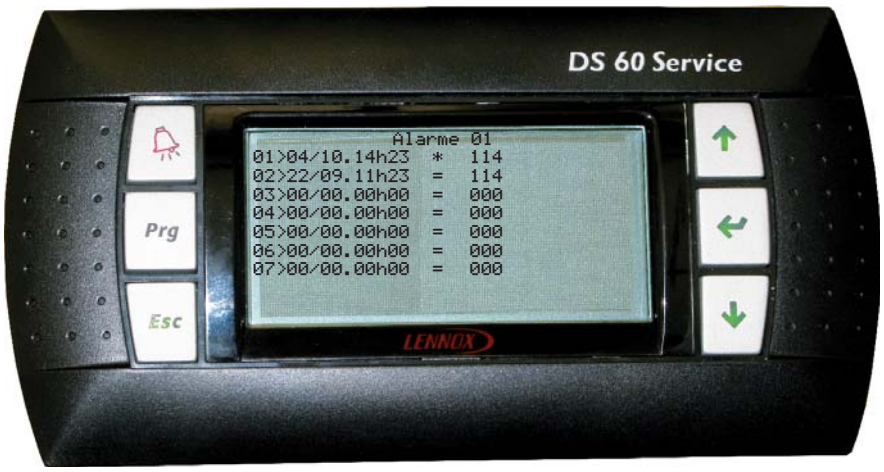
7. The following screen describes the used connection type. Set the display as a Private “Pr” terminal. The other terminals (Trm2 and Trm3) are not used. So their addresses must be adjusted to “None”. Finally confirm the modifications, swapp the text “No” to “Yes” and validate with the“←” key.

After a start up, the first screen contains the main information about the CLIMATIC™ 60‘s software.

The DS60 is organised in 3 menus:
- (**1000**): alarms history,
- (**2000**): user menus for maintenance people,
- (**3000**): expert menus for agreed Lennox authorized Service company (restricted area with password).

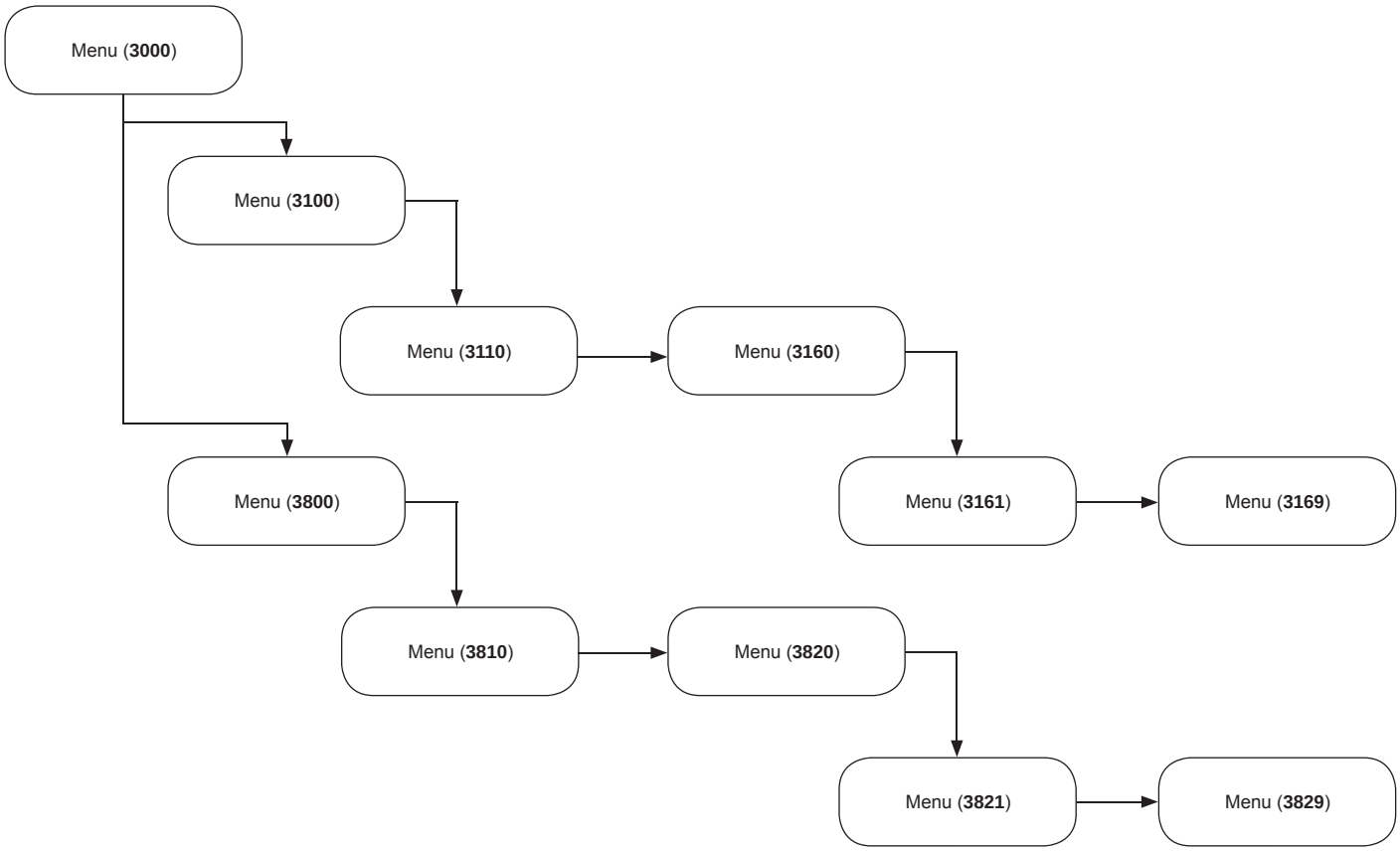
To access to alarms history, press the “ALARM” key when you are in the main menu (**0000**). The CLIMATIC™ 60 saves up to the last 32 alarms. An active alarm is signaled by the symbol “*” whereas an alarm inactive is symbolized by the “=”.

To reset the current active alarm(s) press the “ALARM” key.

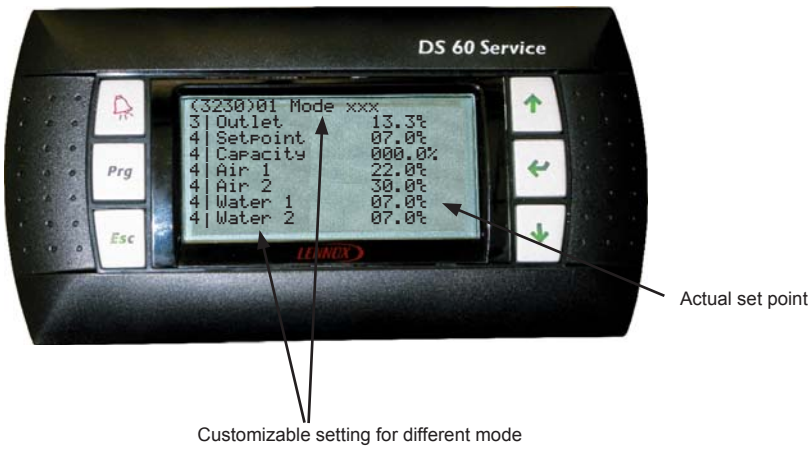


The menus are organised in arborescence tree with submenus as per the scheme hereunder. The actual menu is identified by a 4 digit number between brackets displayed in the top left corner of the screen.
The complete menu list is detailed in the appendix at the end of the document:

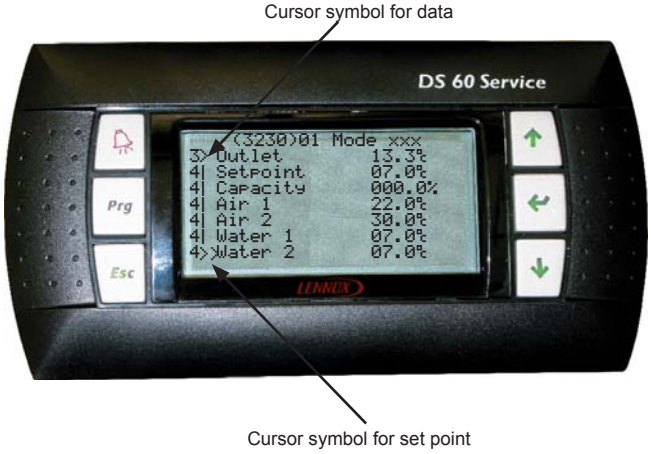
- Description of each menu
- Explanation of each menu code digit.
- Type of information in the menu - Read (R), Write (W), Possibility to write in different schdule zone (Z)
- Min / Factory / Max values



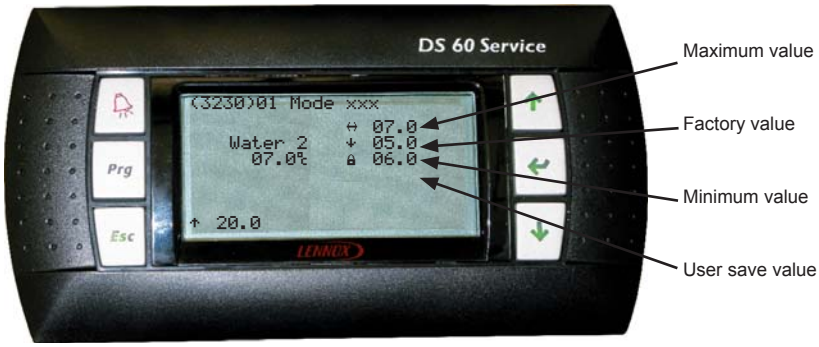
The “↓” and “↑” keys are used to move the cursor on the desired item. Then use the “←” key to enter in the selected submenu. To escape a menu use "ESC" the key.



The submenus contains 2 types of data: the read only data (like a temperature probe for example) and the read/write setpoints (like the cooling ambiant setpoint for example). The data are identified by a cursor symbol “>” (and by a close-padlock in the upper right corner) whereas the setpoint are identify by a symbol “>>” (and by an open-padlock in the upper right corner).



To modify a setting, move the cursor on the desired item and press the “←” key. A new screen displays information concerning this set point. To modify it, use the “↓” and “↑” keys and validate by pressing the “←” key. If the setting is customizable according to the schedule mode, press the “PRG” key to select different value for the Day, Day I, Day II & Night mode.



✍: to quickly increment or decrement the setting, hold the “↓” or “↑” keys during some time.

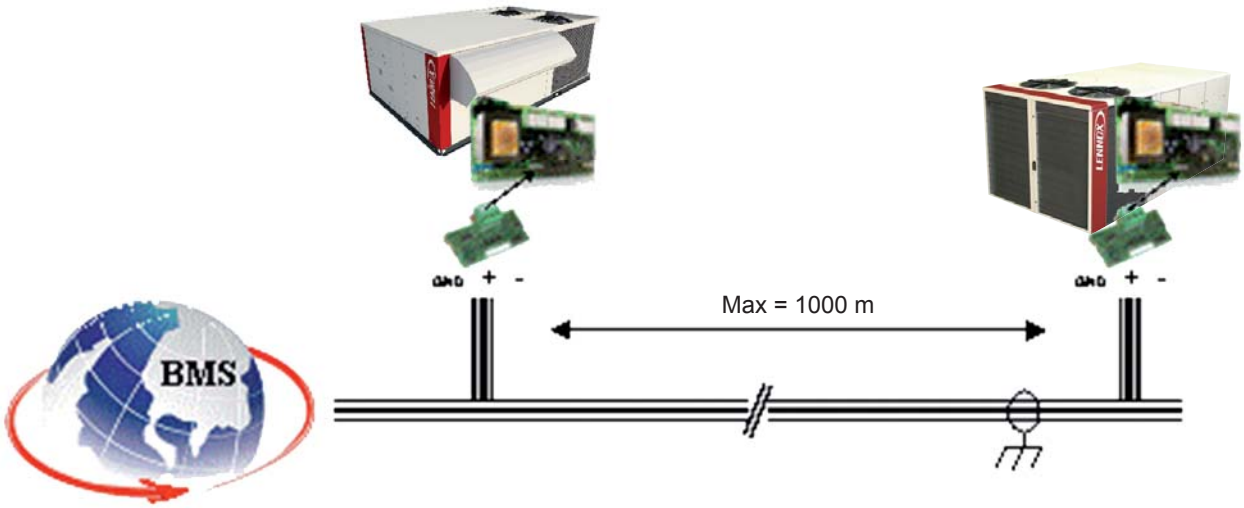
BMS

Function

BMS (building management systems) are systems for the integrated management of all the technological functions of a building, including access control, safety, fire détection, lighting, intelligent elevators, and air-conditioning. The resulting advantages of such solutions are simpler and more efficient management of the building from a single control station, reduction in running costs, possibility of statistical analysis of all data, immediate identification and response to faults and alarms. This amply justify the little extra cost of the air-conditioning unit BMS connectable. Today not only the quality and the reliability of the instruments are important, but also the degree of external connectivity they can offer.

Description

The communication bus is connected on CLIMATIC™ 60's serial card board on the BM60. A star connection is not recommended, for an optimum operation, it is advised to connect a maximum of two cables per unit. In case of RS485 bus, a resistance of 120Ω 1/4W can be connected on the last unit between the terminals + and -.



The CLIMATIC™ 60 offers different possibilities of BMS protocol:

- Modbus RTU,
- Trend,
- Bacnet,
- Lon Works.

Modbus is a serial communications protocol published by Modicon in 1979, and has become a standard communications protocol in industry. It is now the most commonly available method to connect industrial electronic devices.
Controllers communicate using a master–slave technic, in which only one device (master) can initiate transactions (called 'queries'). The other devices (slaves) answer by supplying the requested data to the master, or by taking the action requested in the query.

LENNOX units implement Modbus slave protocol with the following settings:

Serial Line	RS485 (EIA/ TIA - 485 Standard)
Transmission Mode	RTU (Remote Terminal Unit)
Baudrate	1200→19200 Bauds
Data bits	8 bits
Parity	None
Stop bits	1 bit

Settings
The different settings to configure the BMS are available in the menu:

(**3181**): address of the unit (bus id)

(**3182**): choice of type of protocol

(**3183**): choice of speed of bus

(**3184**): watchdog counter

«Watchdog» functionality with CLIMATIC 60.
As the CLIMATIC 60 is passive on the bus, it cannot detect a communication failure with BMS; if any, the Roof-top would continue to operate with the last setting sent by the BMS before the failure whatever they were.

In order to avoid this scenario and tell regularly the CLIMATIC 60 that it is still connected to the BMS, the BMS system has to send regularly to the adress 01h a number above 0.
On its side the CLIMATIC 60 is decreasing the adress 01H value of 5 units every 5 seconds. If the adress 01H reach 0, the climatic 60 consider the communication as lost and switch to stand alone mode.

Example, the BMS is sending the value 1000 to the adress 01h, after 200s if the BMS has not sent anything else, the value will reach 0, the CLIMATIC 60 will consider the communication as lost and the unit will regulate with its own parameters.

Modbus, BACnet, Trend, Carel
Please see the different corresponding tables in the appendix 1.

LonWorks
Please see the different corresponding tables in the appendix 2.

INPUTS / OUTPUTS CLIMATIC™ BOARDS
Digital inputs
Please see the different corresponding tables in the appendix 3.

Digital outputs
Please see the different corresponding tables in the appendix 4.

Analogic inputs
Please see the different corresponding tables in the appendix 5.

Analogic outputs
Please see the different corresponding tables in the appendix 6.

Serial port
Please see the different corresponding tables in the appendix 7.

ALARMS

CODE	DESCRIPTION
1	Blower, Flow Switch, Cut Off
2	Water Condenser, Flow Switch, Cut Off
4	Blower, Filters, Dirty
5	Blower, Filters, Missing
9	Unit Power Supply
11	Electrical Heaters, Overheating
12	Fresh Air,Electrical Heater, Overheating
13	Hot Water, Risk Of Frosting
14	Gas Burner 1, Failure
15	Gas Burner 2, Failure
16	Gas Burner, Overheating
21	Supply Temperature, Too High
22	Supply Temperature, Too Low
23	Room Temperature, Too High
24	Room Temperature, Too Low
25	Water Condenser Temperature, Too Low
26	Water Condenser Temperature, Too High
29	Air Quality, Too High
31	Humidifier, Failure
32	Room Humidity, Too Low
33	Room Humidity, Too High
41	Pump 1, Electrical Failure
51	Recovery, Motor Failure
52	Recovery, Wheel Failure
54	Recovery, Filters, Dirty
56	Recovery Air Flow, Faulty Sensor
59	Recovery, Outlet Temperature, Faulty Probe
61	BM, Master, Failure
62	BM, Slaves, Failure
70	Real Time Clock, Failure
71	BE.1, Communication Bus
72	BE.2, Communication Bus
73	Blower, Inverter, Communication Bus
74	Exhaust, Inverter, Communication Bus
75	Circuit 1, Condenser Fan, Inverter, Communication Bus
76	Circuit 2, Condenser Fan, Inverter, Communication Bus
80	Air Flow, faulty sensor
81	Room Temperature, Faulty Probe
82	Room Humidity, Faulty Sensor
83	Outside Temperature, Faulty Probe
84	Outside Humidity, Faulty Sensor
85	Supply Temperature, Faulty Probe
86	Water Condenser, Inlet, Faulty Probe
87	Water Condenser, Outet, Faulty Probe
88	Return Temperature, Faulty Probe
89	Air Quality, Faulty Sensor
91	Blower, Fan, Failure or Exhaust, Fan, Failure
92	Blower, Inverter, Failure
93	Exhaust, Fan, Failure
94	Exhaust, Inverter, Failure

CODE	DESCRIPTION
99	Fire / Smoke, Detected
101	EVD, Communication Bus
102	Circuit 1, Condenser Fan, Failure
103	Circuit 1, Condenser Fan, Inverter Failure
110	Circuit 1, Refrigerant Leak, Detected
114	Circuit 1, Compressor, Electrical Failure
115	Circuit 1, High Pressure, Cut Off
116	Circuit 1, Reversing Valve, Blocked
117	Circuit 1, Low Pressure, Cut Off
118	Circuit 1, Risk Of Frosting
119	Circuit 1, Low Condensing Temperature
121	Circuit 1, Low Superheat
122	Circuit 1, High Superheat
123	Circuit 1, Low Subcooling
124	Circuit 1, High Subcooling
127	Circuit 1, MOP, Maximum Operating Pressure
128	Circuit 1, LOP, Low Operating Pressure
129	Circuit 1, High Condensing Temperature
132	Circuit 1, Expansion Valve, Motor
141	Circuit 1, High Pressure, Faulty Sensor
142	Circuit 1, Low Presure, Faulty Sensor
143	Circuit 1, Liquid Temperature, Faulty Probe
144	Circuit 1, Suction Temperature, Faulty Probe
202	Circuit 2, Condenser Fan, Failure
203	Circuit 2, Condenser Fan, Inverter Failure
210	Circuit 2, Leak Refrigerant, Detected
214	Circuit 2, Compressor, Electrical Failure
215	Circuit 2, High Pressure, Cut Off
216	Circuit 2, Reversing Valve, Blocked
217	Circuit 2, Low Pressure, Cut Off
218	Circuit 2, Risk Of Frosting
219	Circuit 2, Low Condensing Temperature
221	Circuit 2, Low Superheat
222	Circuit 2, High Superheat
223	Circuit 2, Low Subcooling
224	Circuit 2, High Subcooling
227	Circuit 2, MOP, Maximum Operating Pressure
228	Circuit 2, LOP, Low Operating Pressure
229	Circuit 2, High Condensing Temperature
232	Circuit 2, Expansion Valve, Motor
241	Circuit 2, High Pressure, Faulty Sensor
242	Circuit 2, Low Presure, Faulty Sensor
243	Circuit 2, Liquid Temperature, Faulty Probe
244	Circuit 2, Suction Temperature, Faulty Probe

CODE	DESCRIPTION
310	Circuit 3, Leak Refrigerant, Detected
314	Circuit 3, Compressor, Electrical Failure
315	Circuit 3, High Pressure Cut Off
316	Circuit 3, Reversing Valve, Blocked
317	Circuit 3, Low Pressure Cut Off
319	Circuit 3, Low Condensing Temperature
321	Circuit 3, Low Superheat
322	Circuit 3, High Superheat
323	Circuit 3, Low Subcooling
324	Circuit 3, High Subcooling
327	Circuit 3, MOP, Maximum Operating Pressure
328	Circuit 3, LOP Low Operating Pressure
329	Circuit 3, High Condensing Temperature
341	Circuit 3, High Pressure, Faulty Sensor
342	Circuit 3, Low Presure, Faulty Sensor
343	Circuit 3, Liquid Temperature, Faulty Probe
344	Circuit 3, Suction Temperature, Faulty Probe

ALARM 001:
BLOWER, FLOW SWITCH CUT OFF

Description
The differential pressure between the treatment unit and the filters is too small, although the fan has been running for more than 3 minutes.

Action
Immediate shut down of the complete unit.

Reset
Once the flow has been detected for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)
- Air system obstructed or closed,
- Belts broken,
- Problem with the fan wiring,
- Problem with the pressure transmitter wiring,
- Incorrect settings of the safety threshold.

Remedies
- Check the system,
- Replace the belts,
- Check the connections,
- Check the settings.

ALARM 002:
WATER CONDENSER, FLOW SWITCH CUT OFF

Description
The flow switch has detected a low water flow rate in the condenser heat exchanger for more than 20 seconds whereas the unit was enabling.

Action
Immediate shut down of the compressors.

Reset
Once the flow has been detected for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)
- Problem with the pump control wiring,
- Problem with the flow switch wiring,
- Dirty or clogged water filter,
- Wrong setting of the flow switch,

Remedies
- Check the pump connections,
- Check the flow switch connections,
- Clean the water filter,
- Check the flow switch settings.

ALARM 004, 005: FILTERS, CLOGGED OR MISSING

Description
The differential pressure between the treatment unit and the filters is too small, although the fan has been running for more than 3 minutes.
- Filters missing: ΔP < safety threhold,
- Filters clogged: ΔP > safety threhold.

Action
The alarm is signalling.

Reset
The alarm is automatically deleted once the pressure returns to the authorized operating range.

Possible cause(s)
- Filters removed and not replaced,
- Filters clogged,
- Problem with the pressure transmitter wiring,
- Incorrect setting for the safety thresholds.

Remedies
- Fit new filters,
- Clean or replace the filters,
- Check the connections,
- Check the settings.

ALARM 011, 012: ELECTRICAL HEATERS, OVERHEATING

Description
The status of the safety thermostat of the electrical heater signals an oveheating on the system.

Action
Immediate shut down of the electrical heaters.

Reset
Manual reset.

Possible cause(s)
- Problem with wiring of the electrical heaters,
- Air system obstructed or closed,
- Filter clogged,
- Belts broken.

Remedies
- Check the connections of the electrical heaters,
- Check the air system,
- Clean the filters,
- Replace the belts.

ALARM 013:
HOT WATER, RISK OF FROSTING

Description
The status of the hot water signals a risk of frosting on the system.

Action
The alarm is signalling.

Reset
The trip is manually reset.

Possible cause(s)
- Problem with wiring.

Remedies
- Check the connections.

ALARM 014, 015, 016:
GAS BURNER, FAILURE

Description
The gas burner control box has generated a fault and is no longer controlling the fume extractor fan.

Action
Immediate shut down of the gas burner. The alarm is signalling.

Reset
Once the burner control box has been reset for 2 minutes, the alarm 014 or 015 is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don’t give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset
The alarm 016 requests a manual reset.

Possible cause(s)
- Problem with wiring connection.

Remedies
- Check the gas burner connections.

ALARM 021, 022, 023, 024, 025, 026: TEMPERATURE, OUT OF RANGE

Description
The temperature measured by the probe is outside of the permitted range or the hot water system frost thermostat is activated.

- Alarm 021: the blowing air temperature is higher than the safety limit,
- Alarm 022: the blowing air temperature is lower than the safety limit,
- Alarm 023: the room air temperature is higher than the safety limit,
- Alarm 024: the room air temperature is lower than the safety limit,
- Alarm 025: the water condenser temperature is higher than the safety limit,
- Alarm 026: the water condenser temperature is lower than the safety limit.

Action
Alarms 022 / 024: No action - Alarms 025 / 026: Stop compressors
Alarm 022:
1st threshold - All compressors stop. Fresh air damper closed.
2nd threshold : If there is a hot water coil; the complete unit stops immediately. Otherwise; the unit stops after 15 minutes.
Alarm 021:
1st threshold -One compressor or heating stage stops immediately, then others progressively
2nd threshold - All the compressors and all the back-up heating stages stop
Fault displayed -

Reset
Automatic resetting of fault as soon as the temperature returns to within the permitted operating range, except 3rd safety threshold lower limit which requires a manual reset

Possible cause(s)
- Insufficient airflow / Air damper jammed open
- Frost safety thermostat activated
- Temperature probe failed,
- Problem with wiring of probe.

Remedies
- Check the air system / Check the air damper, mechanically and electrically
- Replace probe,
- Check the connections of the probe.

ALARM 029: AIR QUALITY, TOO HIGH

Description
The air quality measured by the sensor is over of the high limit.

Action
The alarm is signalling.

Reset
The alarm is manually reset.

Possible cause(s)
- Problem with wiring connection (sensor in short circuit or disconnected),
- Sensor damaged.

Remedies
- Check the wiring connections,
- Replace the sensor.

ALARM 031:
HUMIDIFIER, FAILURE

Description
The status of the humidifier signals a failure on the system.

Action
The alarm is signalling. The hulmidifier is stopped.

Reset
The alarm is automatically reset.

Possible cause(s)
- Problem with wiring connection.

Remedies
- Check the wiring connections.

ALARM 032, 033:
ROOM HUMIDITY, OUT OF RANGE

Description
The air ambient humidity is outside the permitted range.
- Alarm 32: the air ambient humidity is lower than the threshold limit,
- Alarm 33: the air ambient humidity is higher than the threshold limit.

Action
The alarm is signalling.

Reset
The alarm is automatically deleted once the temperature has reached the permitted operating range for 2 min.

Possible cause(s)
- Problem with wiring connection.

Remedies
- Check the wiring connections.

ALARM 041:
PUMP 1, ELECTRICAL FAILURE

Description
The electrical protection of the circulator has operated.

Action
The alarm is signalling. The pump is stopped.

Reset
Manual reset.

Possible cause(s)
- Problem with wiring connection.

Remedies
- Check the wiring connections.

ALARM 051: RECOVERY, MOTOR FAILURE

Description
The CLIMATIC™ 60 has detected a failure on the recovery motor.

Action
The alarm is signalling. The motor is stopped.

Reset
The alarm is manually reset.

Possible cause(s)
- Problem with wiring connection.

Remedies
- Check the wiring connections.

ALARM 052: RECOVERY, WHEEL FAILURE

Description
The outlet recovery temperature is over than the safety limit.

Action
The alarm is signalling. The wheel is stopped.

Reset
Once the recovery temperature decrease under the limit for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)
- Problem with wiring connection (sensor in short circuit or disconnected),
- Sensor damaged.

Remedies
- Check the wiring connections,
- Replace the sensor.

ALARM 054: RECOVERY, FILTER DIRTY

Description
The outlet recovery temperature measured by the probe is higher than the setting (**3875**).

Action
The alarm is signalling.

Reset
The alarm is manually reset.

Possible cause(s)
- Problem with wiring connection.

Remedies
- Check the wiring connections.

ALARM 061, 062:
CLIMATIC™ BOARD LINK, FAILURE

Description
The link between the master / slave CLIMATIC™ 60 boards is faulty.
- Alarm 61: Master CLIMATIC™ 60 N°1 board disconnected,
- Alarm 62: Slave CLIMATIC™ 60 board disconnected.

Action
- Swap immediately the unit in stand alone mode.
- The alarm is signalling.

Reset
Once the communication is re-established for 30 s, the alarm is automatically deleted. Up to 6 trips can occur during a day and are saved in the alarm history. The five first trips don't give the alarm alert, and the alarm counter is reset every day at 6 am. The sixth trip activates the fault report and must be manually reset.

Possible cause(s)
- Problem with wiring connection,
- CLIMATIC™ 60 board power off,
- CLIMATIC™ 60 board damaged.

Remedies
- Check the wiring connections,
- Check the power of CLIMATIC™ 60 board,
- Replace the CLIMATIC™ 60 board.

ALARM 070:
REAL TIME CLOCK BOARD, FAILURE

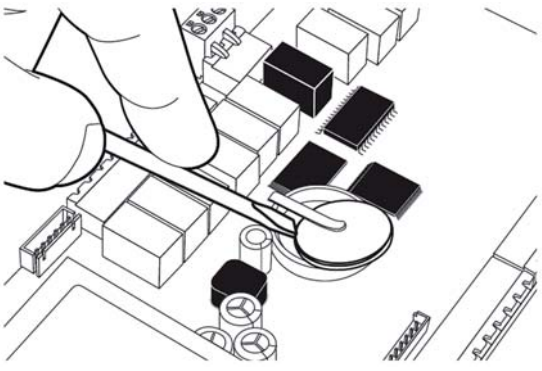
Description
The real time clock board of the CLIMATIC™ 60 doesn't work. The battery if out of order or wrongly placed.

Action
The alarm is signalling.

Reset
The alarm is manually reset.

Possible cause(s)
- Battery level too low,
- CLIMATIC™ 60 board damaged.

Remedies
- Replace the battery (do not dispose of the product in a municipal waste; it must be disposed of through specialist waste disposal centres),
- Replace the CLIMATIC™ 60 board.



ALARM 071, 072: EXPANSION BOARD LINK, FAILURE

Description

The link between the expansion board(s) 1 or 2 and the CLIMATIC™ 60 is disconnected.

- Alarm 71: the expansion board N°1 is disconnected from the CLIMATIC™ 60,
- Alarm 72: the expansion board N°2 is disconnected from the CLIMATIC™ 60.

Action

- Immediate shut down of the unit.
- The alarm is signalling.

Reset

Once the communication is re-established for 30 s, the alarm is automatically deleted.

Possible cause(s)

- Problem with wiring connection,
- Wrong expansion board address,
- Expansion board damaged.

Remedies

- Check the wiring connections,
- Check the expansion board address (refer to the “FREE INPUT / OUTPUT” paragraph),
- Replace the expansion board.

ALARM 073, 074, 075, 076: INVERTER LINK, FAILURE

Description

The link between the inverter and the CLIMATIC™ 60 has been disconnected for 5 s.

- Alarm 073: the blower inverter is disconnected from the CLIMATIC™ 60,
- Alarm 074: the exhaust inverter is disconnected from the CLIMATIC™ 60,
- Alarm 075: the condenser fan inverter of circuit 1 is disconnected from the CLIMATIC™ 60,
- Alarm 076: the condenser fan inverter of circuit 2 is disconnected from the CLIMATIC™ 60,

Action

- Alarm 073: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 074: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 075: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 076: immediate shut down of circuit 2. The alarm is signalling,

Reset

Once the communication is re-established for 2 minutes, the alarm is automatically deleted.

Possible cause(s)

- Problem with wiring connection,
- Wrong inverter address,
- Inverter damaged.

Remedies

- Check the wiring connections,
- Check the inverter address,
- Replace the inverter.

ALARM 056, 059, 080, 081, 082, 083, 084, 085, 086, 087, 088, 089, 141, 142, 143, 144, 241, 242, 243, 244, 341, 342, 343, 344: PROBE & SENSOR, FAULTY

Description

- The temperature probe or pressure sensor measured by the CLIMATIC™ 60 or other expansion boards is incorrect. The device may
- be disconnected or in short circuit for 5s.
- Alarm 056: the recovery air flow sensor value is incorrect,
- Alarm 059: the outlet recovery air temperature probe value is incorrect,
- Alarm 080: the supply air flow sensor value is incorrect,
- Alarm 081: the room air temperature probe value is incorrect,
- Alarm 082: the room air humidity sensor value is incorrect,
- Alarm 083: the outside air temperature probe value is incorrect,
- Alarm 084: the outside air humidity sensor value is incorrect,
- Alarm 085: the supply air temperature probe value is incorrect,
- Alarm 086: the inlet water condenser temperature probe value is incorrect,
- Alarm 087: the outlet water condenser temperature probe value is incorrect,
- Alarm 088: the return air temperature probe value is incorrect,
- Alarm 089: the air quality sensor value is incorrect,
- Alarm 141, 241, 341: the high pressure sensor value on circuit 1, 2 or 3 is incorrect,
- Alarm 142, 242, 342: the low pressure sensor value on circuit 1, 2 or 3 is incorrect,
- Alarm 143, 243, 343: the liquid temperature probe value on circuit 1, 2 or 3 is incorrect,
- Alarm 144, 244, 344: the suction temperature probe value on circuit 1, 2 or 3 is incorrect,

Action

- Alarm 056: immediate shut down of the recovery module. The alarm is signaling,
- Alarm 059: immediate shut down of the recovery module. The alarm is signaling,
- Alarm 080: immediate shut down of the complete unit. The blower still works, The alarm is signaling,
- Alarm 081: immediate shut down of the complete unit. The blower still works, The alarm is signaling,
- Alarm 082: immediate shut down of the complete unit. The blower still works, The alarm is signaling,
- Alarm 083: immediate shut down of the complete unit. The blower still works, The alarm is signaling,
- Alarm 084: immediate shut down of the complete unit. The blower still works, The alarm is signaling,
- Alarm 085: immediate shut down of the complete unit. The blower still works, The alarm is signaling,
- Alarm 086: immediate shut down of all circuit. The alarm is signaling,
- Alarm 087: immediate shut down of all circuit. The alarm is signaling,
- Alarm 089: don't stop the unit. The alarm is signaling,
- Alarm 141, 241, 341: immediate shut down of the circuit 1, 2 or 3. The alarm is signaling,
- Alarm 142, 242, 342: immediate shut down of the circuit 1, 2 or 3. The alarm is signaling,
- Alarm 143, 243, 343: immediate shut down of the circuit 1, 2 or 3. The alarm is signaling,
- Alarm 144, 244, 344: immediate shut down of the circuit 1, 2 or 3. The alarm is signaling,

Reset

Once the data read is coherent for 2 minutes, the alarm is automatically deleted.

Possible cause(s)

- Problem with wiring connection,
- Probe or sensor damaged.

Remedies

- Check the wiring connections,
- Replace the probe or sensor.

ALARM 091:
BLOWER OR EXHAUST FAN, FAILURE

Description
The fan motor control is no longer active.
- Alarm 091: the air conditioning fan motor or the exhaust fan motor control is no longer active,

Action
Immediate shut down of the complete unit. The alarm is signalling.

Reset
The alarm is manually reset.

Possible cause(s)
- Fire safety thermostat active
- Thermal motor protection devices activated,
- Problem with wiring connection,
- Fan motor damaged.

Remedies
- Reset the thermostat,
- Check the air system,
- Check the connection,
- Replace the fan motor.

ALARM 099:
FIRE / SMOKE, DETECTED

Description
The stand-alone detector switch (DAD) has detected the presence of smoke in the unit.

Action
Immediate shut down of the complete unit and fresh air damper opening (or closing with set point (**3114**)). The alarm is signalling.

Reset
The alarm is manually reset.

Possible cause(s)
- Problem with the DAD

Remedies
- Check the connection.

ALARM 092, 094, 103, 203: FAN INVERTER, FAILURE

Description

The CLIMATIC™ 60 has detected an alarm on the pump inverter or the fan inverter.

- Alarm 092: inverter failure of the blower fan,
- Alarm 094: inverter failure of the exhaust fan,
- Alarm 103: inverter failure of the condenser fan on circuit 1,
- Alarm 203: inverter failure of the condenser fan on circuit 2.

Action

- Alarm 092: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 094: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 103: immediate shut down of the circuit 1. The alarm is signalling,
- Alarm 203: immediate shut down of the circuit 2. The alarm is signalling.

Reset

Once the communication is re-established for 2 minutes, the alarms 094 / 103 / 203 are automatically reset.
For the alarm 092, once the communication is re-established for 2 minutes, the alarm is automatically reset. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)

- Problem with wiring connection,
- Pump or fan damaged,
- Inverter damaged.

Remedies

- Check the inverter connection,
- Replace the pump or fan,
- Replace the inverter.

ALARM 102, 202: CONDENSER FAN, ELECTRICAL FAILURE

Description

The thermal motor protection of the condenser fan has detected an over temperature for 5 s, while the fan motor was in demand for at least 5 s.

- Alarm 102: thermal motor protection of the condenser fan on circuit 1,
- Alarm 202: thermal motor protection of the condenser fan on circuit 2.

Action

- Alarm 102: the alarm is signalling,
- Alarm 202: the alarm is signalling

Reset

Once the data read is coherent for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)

- Wrong air flow operating,
- Problem with wiring connection,
- Fan motor damaged.

Remedies

- Check the air system,
- Check the connection,
- Replace the fan motor.

ALARM 110, 210, 310: LEAK REFRIGERANT, DETECTION

Description
The CLIMATIC™60 has detected a risk of leakage of the refrigerant circuit.

Action
The alarm is signalling.

Reset
The alarm is manually reset.

Possible cause(s)
- Problem of refrigerant capacity.

Remedies
- Check the frigorific system operation

ALARM 114, 214, 314: COMPRESSOR, ELECTRICAL FAILURE

Description
The thermal magnetic circuit breaker protection or the thermal motor protection of the compressor has tripped.
- Alarm n14: thermal magnetic circuit breaker on circuit n,

Action
Immediate shut down of the complete circuit. The alarm is signalling.

Reset
Once the circuit has been stopped for 30 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)
- Problem with wiring connection,
- Coil condenser dirty,
- Fan condenser not operating.

Remedies
- Check the wiring connection,
- Clean the coil condenser,
- Check the fan operating.

ALARM 116, 216, 316: REVERSING VALVE, BLOCKED

Description
The CLIMATIC™ 60 hasn't measured a difference of pressure of 2 bars for 5 s, while a compressor was running for 30 s.
- Alarm n16: reversing valve blocked on circuit n,

Action
Immediate shut down of the complete circuit. The alarm is signalling.

Reset
Once the circuit has been stopped for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)
- Problem with wiring connection,
- Problem of reversing valve.

Remedies
- Check the wiring connection,
- Replace the reversing valve.

ALARM 117, 217, 317: LOW OPERARTING PRESSURE, FAULTY

Description
The suction temperature calculated by the LP pressure sensor is lower than the permitted threshold. The temperature has reached -27.0°C for more than 2 mn while a compressor is running for 2 mn. The alarm is disable during the defrost procédure.
- Alarm n17: suction temperature too low on circuit n,

Action
Immediate shut down of the complete circuit. The alarm is signalling.

Reset
Once the circuit has been stopped for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert except if a trip is still present for 1 hour, and the alarm counter is reset every day at 11 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)
- Problem of refrigerant capacity.

Remedies
- Check the frigorific system operation.

ALARM 118, 218:
WATER EVAPORATOR, RISK OF FROSTING

Description
The evaporating pressure measured by the LP sensor is too low and may pose a risk for the water evaporator. These alarms are disabled if the glycol rate is greater than 45%. The LP pressure has reached the limit of 0°C for 2 minutes while a compressor was running for at least 2 minutes. This alarm is disabled during 1 minute when a compressor start or stop or during the defrost procédure.
- Alarm 118: risk of frosting the water evaporator by circuit 1,
- Alarm 218: risk of frosting the water evaporator by circuit 2.

Action
Immediate shut down of the complete circuit. The alarm is signalling.

Reset
Once the suction pressure is higher than 0°C for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day and are saved in the alarm history. The two first trips don't give the alarm alert except if a trip is still present for 1 hour, and the alarm counter is reset every day at 6 am. The third trip activates the fault report and must be manually reset.

Possible cause(s)
- Problem of refrigerant capacity
- Problem with the expansion valve.

Remedies
- Check the frigorific system operation,
- Replace the expansion valve.

ALARM 121, 221, 321:
EVAPORATOR, TEMPERATURE SUPERHEAT TOO HIGH

ALARM 122, 222, 322:
EVAPORATOR, TEMPERATURE SUPERHEAT TOO LOW

Description
The CLIMATIC™60 indicates an over-temperature:
- Alarm n21: superheat temperature too low on circuit n,
- Alarm n22: superheat temperature too high on circuit n,

Action
These alarms are only reported: it had no effect on compressors.

Reset
The alarm is automatically deleted if the temperature is correct. This trip is saved in the alarm history only if the DS60 is connected or if 999 faults were activated during one day.
The daily counter is automatically reset every day at 11 am. The 999th trip is locked and must be manually reset.

Possible cause(s)
- Problem of refrigerant capacity
- Problem with the expansion valve.

Remedies
- Check the frigorific system operation,
- Replace the expansion valve.

ALARM 123, 223, 323:
CONDENSER, TEMPERATURE SUBCOOLING TOO LOW

ALARM 124, 224, 323:
CONDENSER, TEMPERATURE SUBCOOLING TOO HIGH

Description
The CLIMATIC™60 indicates an over-temperature:
- Alarm n23: air / water evaporator subcooling too low on circuit n,
- Alarm n24: air / water evaporator subcooling too high on circuit n,

Action
These alarms are only reported: it had no effect on compressors.

Reset
The alarm is automatically deleted if the temperature is correct. This trip is saved in the alarm history only if the DS60 is connected or if 999 faults were activated during one day.
The daily counter is automatically reset every day at 11 am. The 999th trip is locked and must be manually reset.

Possible cause(s)
- Problem of refrigerant capacity
- Problem with the expansion valve.

Remedies
- Check the frigorific system operation,
- Replace the expansion valve.

ALARM 127, 227, 327:
MAXIMUM OPERATING PRESSURE (MOP), FAULTY

ALARM 128, 228, 328:
LOW OPERATING PRESSURE (LOP), FAULTY

Description
The suction pressure measured by the CLIMATIC™ 60 is outside a permitted range.
- Alarm n27: Max operating pressure on circuit n,
- Alarm n28: Low operating pressure on circuit n,

Action
These alarms are only reported: it had no effect on compressors.

Reset
The alarm is automatically deleted if the pressure is correct. This trip is saved in the alarm history only if the DS60 is connected or if 999 faults were activated during one day.
The daily counter is automatically reset every day at 11 am. The 999th trip is locked and must be manually reset.

Possible cause(s)
- Problem of refrigerant capacity

Remedies
- Check the frigorific system operation

ALARM 119, 219, 319:
CONDENSER, TEMPERATURE TOO LOW

ALARM 129, 229, 329:
CONDENSER, TEMPERATURE TOO HIGH

Description
The CLIMATIC™60 indicates an over-temperature:
- Alarm n19: Condensing temperature too low on circuit n,
- Alarm n29: Condensing temperature too high on circuit n,

Action
These alarms are only reported: it had no effect on compressors.

Reset
The alarm is automatically deleted if the temperature is correct. This trip is saved in the alarm history only if the DS60 is connected or if 999 faults were activated during one day.
The daily counter is automatically reset every day at 11 am. The 999th trip is locked and must be manually reset.

Possible cause(s)
- Problem of refrigerant capacity

Remedies
- Check the frigorific system operation

CLIMATIC™ 60 ROOFTOP

APPENDIX

Ref : CL60_ROOFTOP_Appendix-IOM-0412-E

BMS

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APPENDIX 1
Modbus, BACnet, Trend, Carel

@Address		R/W	DESCRIPTION	MIN	Fact.	MAX
0						
1	Integer	R/W	bms, watchdog counter	0	0	32767
2	Analog	R/W	control, bms day, set point of cooling mode	8.0	22.0	35.0
3	Analog	R/W	control, bms day, set point of heating mode	8.0	19.0	35.0
4	Analog	R/W	economizer, bms day, set point of minimum fresh air	0.0	20.0	100.0
5	Analog	R/W	control, bms night, set point of cooling mode	8.0	35.0	35.0
6	Analog	R/W	control, bms night, set point of heating mode	8.0	15.0	35.0
7	Analog	R/W	economizer, bms night, set point of minimum fresh air	0.0	0.0	100.0
8	Analog	R/W	control, bms day, set point of dehumidification	0.0	100.0	100.0
9	Analog	R/W	control, bms day, set point of humidification	0.0	0.0	100.0
10	Analog	R/W	control, bms night, set point of dehumidification	0.0	100.0	100.0
11	Analog	R/W	control, bms night, set point of humidification	0.0	0.0	100.0
12	Analog	R/W	blower, bms day, nominal threshold for air flow control	0.0	~	100.0
13	Analog	R/W	blower, bms night, nominal threshold for air flow control	0.0	~	100.0
14	Integer	R/W	power meter, value for reset memory	0	0	65536
15	Integer	R/W	clock, hour setting	0	~	23
16	Integer	R/W	clock, minute setting	0	~	59
17	Integer	R/W	clock, day setting	1	~	31
18	Integer	R/W	clock, month setting	1	~	12
19	Integer	R/W	clock, year setting	0	~	99
20	Analog	R/W	emulation, value of the room temperature send by bms	-99.9	-99.9	99.9
21	Analog	R/W	emulation, value of the room humidity send by bms	0.0	0.0	100.0
22	Analog	R/W	emulation, value of the outside temperature send by bms	-99.9	-99.9	99.9
23	Analog	R/W	emulation, value of the outside humidity send by bms	0.0	0.0	100.0
24	Integer	R/W	emulation, value of the air quality send by bms	0	0	2000
25	Analog	R/W	emulation, value of the speed blower send by bms	0.0	0.0	100.0
26	Integer	R	power meter, value of the real power	0	~	65536
27	Integer	R	power meter, value of the reactive power	0	~	65536
28	Integer	R	power meter, value of the power factor	0	~	65536
29	Integer	R	power meter, value (weight low) of the real energy	0	~	65536
30	Integer	R	power meter, value (weight high) of the real energy	0	~	65536
31	Integer	R	power meter, value (weight low) of the reactive energy	0	~	65536
32	Integer	R	power meter, value (weight high) of the reactive energy	0	~	65536
33	Analog	R	control, set value of cooling mode	8.0	~	35.0
34	Analog	R/W	control, customer (dc/dm) set point	8.0	20.5	35.0
35	Analog	R	control, set value of heating mode	8.0	~	35.0
36	Integer	R	alarm, codes	0	~	999
37	Analog	R	control, value of the room temperature	-99.9	~	99.9
38	Analog	R	control, value of the outside temperature	-99.9	~	99.9
39	Analog	R	control, value of the supply temperature	-99.9	~	99.9
40	Analog	R	control, value of the return temperature	-99.9	~	99.9
41	Analog	R	control, value of the room humidity	0.0	~	100.0
42	Analog	R	control, calculated value of the room absolute humidity	0.0	~	99.9
43	Analog	R	control, value of the outside humidity	0.0	~	100.0
44	Analog	R	control, calculated value of the outside absolute humidity	0.0	~	99.9
45	Integer	R	blower, value of differential pressure sensor on air flow	0	~	1000
46	Integer	R	economizer, value of air quality sensor	0	~	2000
47	Analog	R	economizer, opening percentage send to the actuator	0.0	~	100.0
48	Analog	R	gas heaters, opening percentage calculated for the valve	0.0	~	100.0
49	Analog	R	electrical heaters, power percentage calculated for the triac	0.0	~	100.0

@Address		R/W	DESCRIPTION	MIN	Fact.	MAX
50	Analog	R	hot water coil, opening percentage calculated for the valve	0.0	~	100.0
51	Analog	R	humidifier, power percentage calculated for the proportional signal	0.0	~	100.0
52	Analog	R	remote control, value of the signal, be-1 b1, temperature	-99.9	~	99.9
53	Analog	R	remote control, value of the signal, be-1 b2, temperature	-99.9	~	99.9
54	Analog	R	remote control, value of the signal, be-1 b3, temperature	-99.9	~	99.9
55	Analog	R	remote control, value of the signal, be-1 b4, temperature	-99.9	~	99.9
56	Analog	R	remote control, value of the signal, be-1 b1, humidity	0.0	~	100.0
57	Analog	R	remote control, value of the signal, be-1 b2, humidity	0.0	~	100.0
58	Analog	R	remote control, value of the signal, be-1 b3, humidity	0.0	~	100.0
59	Analog	R	remote control, value of the signal, be-1 b4, humidity	0.0	~	100.0
60	Integer	R	unit, count value (weight low) of operating time	0	~	65536
61	Integer	R	unit, count value (weight high) of operating time	0	~	65536
62	Integer	R	blower, count value (weight low) of operating time	0	~	65536
63	Integer	R	blower, count value (weight high) of operating time	0	~	65536
64	Integer	R	circuit 1 compressor 1, count value (weight low) of operating time	0	~	65536
65	Integer	R	circuit 1 compressor 1, count value (weight high) of operating time	0	~	65536
66	Integer	R	circuit 1 compressor 2, count value (weight low) of operating time	0	~	65536
67	Integer	R	circuit 1 compressor 2, count value (weight high) of operating time	0	~	65536
68	Integer	R	circuit 2 compressor 1, count value (weight low) of operating time	0	~	65536
69	Integer	R	circuit 2 compressor 1, count value (weight high) of operating time	0	~	65536
70	Integer	R	circuit 2 compressor 2, count value (weight low) of operating time	0	~	65536
71	Integer	R	circuit 2 compressor 2, count value (weight high) of operating time	0	~	65536
72	Integer	R	blower, calculated value of air flow	0	~	32767
73			not used	-32768	~	32767
74	Integer	R	[Alarm - Major]	0	~	65536
			bit.0 = (70) Real Time Clock			
			bit.1 = (71) BE.1, Communication Bus			
			bit.2 = (72) BE.2, Communication Bus			
			bit.3 =			
			bit.4 = (81) Room Temperature, Probe			
			bit.5 = (82) Room Humidity, Sensor			
			bit.6 = (83) Outside Temperature, Probe			
			bit.7 = (85) Supply Temperature, Probe			
			bit.8 = (88) Return Temperature, Probe			
			bit.9 = (22) Supply Temperature, Too Low			
			bit.10 = (80) Air Flow, Sensor			
			bit.11 = (73) Blower, Inverter, Communication Bus			
			bit.12 = (1) Blower, Flow Switch Cut Off			
			bit.13 = (91) Blower, Fan			
			bit.14 = (92) Blower, Inverter			
			bit.15 = (99) Fire / Smoke, Detected			

@Address		R/W	DESCRIPTION	MIN	Fact.	MAX
75	Integer	R	[Alarm - Major]	0	~	65536
			bit.0 = (74) Exhaust, Inverter, Communication Bus			
			bit.1 = (93) Exhaust, Fan			
			bit.2 = (94) Exhaust, Inverter			
			bit.3 =			
			bit.4 = (59) Recovery, Outlet Temperature, Probe			
			bit.5 = (56) Recovery, Air Flow, Sensor			
			bit.6 = (51) Recovery, Motor			
			bit.7 = (52) Recovery, Wheel			
			bit.8 =			
			bit.9 = (13) Hot Water, Risk Of Frosting			
			bit.10 = (41) Pump 1, Electrical			
			bit.11 = (11) Electrical Heaters, Overheating			
			bit.12 = (12) Fresh Air, Electrical Heater, Overheating			
			bit.13 = (14) Gas Burner 1			
			bit.14 = (15) Gas Burner 2			
			bit.15 = (16) Gas Burner, Overheating			
76	Integer	R	[Alarm - Major]	0	~	65536
			bit.0 = (141) Circuit 1, High Pressure, Sensor			
			bit.1 = (142) Circuit 1, Low Presure, Sensor			
			bit.2 = (143) Circuit 1, Liquid Temperature, Probe			
			bit.3 = (144) Circuit 1, Suction Temperature, Probe			
			bit.4 = (114) Circuit 1, Compressor, Electrical			
			bit.5 = (115) Circuit 1, High Pressure Cut Off			
			bit.6 = (116) Circuit 1, Reversing Valve, Blocked			
			bit.7 = (117) Circuit 1, Low Pressure Cut Off			
			bit.8 = (118) Circuit 1, Risk Of Frosting			
			bit.9 = (132) Circuit 1, Expansion Valve, Motor			
			bit.10 = (75) Circuit 1, Condenser Fan, Inverter, Communication Bus			
			bit.11 = (102) Circuit 1, Condenser Fan			
			bit.12 = (103) Circuit 1, Condenser Fan, Inverter			
			bit.13 = (86) Water Condenser, Inlet, Probe			
			bit.14 = (87) Water Condenser, Outlet, Probe			
			bit.15 =			

@Address		R/W	DESCRIPTION	MIN	Fact.	MAX
77	Integer	R	[Alarm - Major]	0	~	65536
			bit.0 = (241) Circuit 2, High Pressure, Sensor			
			bit.1 = (242) Circuit 2, Low Presure, Sensor			
			bit.2 = (243) Circuit 2, Liquid Temperature, Probe			
			bit.3 = (244) Circuit 2, Suction Temperature, Probe			
			bit.4 = (214) Circuit 2, Compressor, Electrical			
			bit.5 = (215) Circuit 2, High Pressure Cut Off			
			bit.6 = (216) Circuit 2, Reversing Valve, Blocked			
			bit.7 = (217) Circuit 2, Low Pressure Cut Off			
			bit.8 = (218) Circuit 2, Risk Of Frosting			
			bit.9 = (232) Circuit 2, Expansion Valve, Motor			
			bit.10 = (76) Circuit 2, Cond. Fan, Inverter, Communication Bus			
			bit.11 = (202) Circuit 2, Condenser Fan			
			bit.12 = (203) Circuit 2, Condenser Fan, Inverter			
			bit.13 = (2) Water Condenser, Flow Switch Cut Off			
			bit.14 = (25) Water Condenser Temperature, Too Low			
			bit.15 = (26) Water Condenser Temperature, Too High			
78	Integer	R	[Alarm - Minor]	0	~	65536
			bit.0 = (84) Outside Humidity, Sensor			
			bit.1 = (23) Room Temperature, Too High			
			bit.2 = (24) Room Temperature, Too Low			
			bit.3 = (32) Room Humidity, Too Low			
			bit.4 = (33) Room Humidity, Too High			
			bit.5 = (21) Supply Temperature, Too High			
			bit.6 = (4) Blower, Filters, Dirty			
			bit.7 = (5) Blower, Filters, Missing			
			bit.8 = (89) Air Quality, Sensor			
			bit.9 = (29) Air Quality, Too High			
			bit.10 = (54) Recovery, Filters, Dirty			
			bit.11 = (31) Humidifier, Failure			
			bit.12 =			
			bit.13 =			
			bit.14 = (110) Circuit 1, Leak Refrigerant, Detected			
			bit.15 = (210) Circuit 2, Leak Refrigerant, Detected			

@Address		R/W	DESCRIPTION	MIN	Fact.	MAX
79	Integer	R	[Alarm - Minor] bit.0 = (119) Circuit 1, Low Condensing Temperature bit.1 = (129) Circuit 1, High Condensing Temperature bit.2 = (128) Circuit 1, LOP, Low Operating Pressure bit.3 = (127) Circuit 1, MOP, Maximum Operating Pressure bit.4 = (121) Circuit 1, Low Superheat bit.5 = (122) Circuit 1, High Superheat bit.6 = (123) Circuit 1, Low Subcooling bit.7 = (124) Circuit 1, High Subcooling bit.8 = (219) Circuit 2, Low Condensing Temperature bit.9 = (229) Circuit 2, High Condensing Temperature bit.10 = (228) Circuit 2, LOP, Low Operating Pressure bit.11 = (227) Circuit 2, MOP, Maximum Operating Pressure bit.12 = (221) Circuit 2, Low Superheat bit.13 = (222) Circuit 2, High Superheat bit.14 = (223) Circuit 2, Low Subcooling bit.15 = (224) Circuit 2, High Subcooling	0	~	65536
80		R	not used	-32768	~	32767
81		R	not used	-32768	~	32767
82		R	not used	-32768	~	32767
83		R	not used	-32768	~	32767
84	Integer	R/W	unit, general on/off, start & stop, set point	0	0	1
85	Integer	R/W	unit, reset alarms, set point	0	0	1
86	Integer	R/W	blower, bms day, setpoint for activation operation	0	1	1
87	Integer	R/W	blower, bms day, setpoint for activation operation, in room control dead zone	0	1	1
88	Integer	R/W	blower, bms night, setpoint for activation operation	0	1	1
89	Integer	R/W	blower, bms night, setpoint for activation operation, in room control dead zone	0	0	1
90	Integer	R/W	bms, night mode forced by bms	0	0	1
91	Integer	R/W	economizer, bms day, setpoint for activation operation in free-cooling	0	1	1
92	Integer	R/W	economizer, bms night, setpoint for activation operation in free-cooling	0	1	1
93	Integer	R/W	economizer, bms day, setpoint for activation operation of air quality	0	1	1
94	Integer	R/W	economizer, bms night, setpoint for activation operation of air quality	0	1	1
95	Integer	R/W	circuit, bms day, setpoint for activation operation in cooling mode	0	1	1
96	Integer	R/W	circuit, bms day, setpoint for activation operation in heating mode	0	1	1
97	Integer	R/W	circuit, bms night, setpoint for activation operation in cooling mode	0	1	1
98	Integer	R/W	circuit, bms night, setpoint for activation operation in heating mode	0	1	1
99	Integer	R/W	1st heaters, bms day, setpoint for activation operation	0	1	1
100	Integer	R/W	1st heaters, bms night, setpoint for activation operation	0	1	1
101	Integer	R/W	control, bms day, setpoint for activation operation of humidity	0	0	1
102	Integer	R/W	control, bms night, setpoint for activation operation of humidity	0	0	1
103	Integer	R/W	circuit, unloaded 50% of compressors running by bms	0	0	1
104	Integer	R/W	clock, setting mode	0	0	1
105	Integer	R/W	remote control, activation of bm j14 no7	0	0	1
106	Integer	R/W	remote control, activation of bm j15 no12	0	0	1
107	Integer	R/W	remote control, activation of be-1 j5 no1	0	0	1

@Address		R/W	DESCRIPTION	MIN	Fact.	MAX
108	Integer	R/W	remote control, activation of be-1 j6 no2	0	0	1
109	Integer	R/W	remote control, activation of be-1 j7 no3	0	0	1
110	Integer	R/W	remote control, activation of be-1 j8 no4	0	0	1
111	Integer	R/W	tcb, activation of feature	0	0	1
112	Integer	R/W	tcb, state of b signal	0	0	1
113	Integer	R/W	tcb, state of g signal	0	0	1
114	Integer	R/W	tcb, state of y1 signal	0	0	1
115	Integer	R/W	tcb, state of y2 signal	0	0	1
116	Integer	R/W	tcb, state of w1 signal	0	0	1
117	Integer	R/W	tcb, state of w2 signal	0	0	1
118	Integer	R/W	control, unloaded cooling mode by bms	0	0	1
119	Integer	R/W	control, unloaded heating mode by bms	0	0	1
120	Integer	R/W	blower, low speed forced by bms	0	0	1
121	Integer	R/W	blower, high speed forced by bms	0	0	1
122	Integer	R/W	economizer, opening to 0% forced by bms	0	0	1
123	Integer	R/W	economizer, opening to 100% forced by bms	0	0	1
124	Integer	R/W	economizer, unloaded air quality by bms	0	0	1
125	Integer	R/W	economizer, unloaded free-cooling by bms	0	0	1
126	Integer	R/W	economizer, unloaded free-heating by bms	0	0	1
127	Integer	R/W	circuit, unloaded 100% by bms	0	0	1
128		R	circuit, unloaded 50% of compressors running by bms	0	0	1
129	Integer	R/W	circuit, unloaded heating mode by bms	0	0	1
130	Integer	R/W	circuit, defrost cycle delayed by bms	0	0	1
131	Integer	R/W	1st heaters, unloaded 50% of heaters running by bms	0	0	1
132	Integer	R/W	1st heaters, unloaded 100% by bms	0	0	1
133	Integer	R	alarm, state	0	~	1
134	Integer	R	unit, state of the general on/off	0	~	1
135	Integer	R	blower, state	0	~	1
136	Integer	R	exhaust, state	0	~	1
137	Integer	R	circuit 1 compressor 1, state	0	~	1
138	Integer	R	circuit 1 compressor 2, state	0	~	1
139	Integer	R	circuit 1, state of the reversing valve (heating mode)	0	~	1
140	Integer	R	circuit 2 compressor 1, state	0	~	1
141	Integer	R	circuit 2 compressor 2, state	0	~	1
142	Integer	R	circuit 2, state of the reversing valve (heating mode)	0	~	1
143	Integer	R	gas heaters, state of 1st burner	0	~	1
144	Integer	R	gas heaters, state of 2nd burner	0	~	1
145	Integer	R	gas heaters, state of the full power	0	~	1
146	Integer	R	electrical heaters, state of 1st burner	0	~	1
147	Integer	R	electrical heaters, state of 2nd burner	0	~	1
148	Integer	R	remote control, state of the dry contact, bm id4	0	~	1
149	Integer	R	remote control, state of the dry contact, bm id7	0	~	1
150	Integer	R	remote control, state of the dry contact, be-1 id1	0	~	1
151	Integer	R	remote control, state of the dry contact, be-1 id2	0	~	1

@Address		R/W	DESCRIPTION	MIN	Fact.	MAX
152	Integer	R	remote control, state of the dry contact, be-1 id3	0	~	1
153	Integer	R	remote control, state of the dry contact, be-1 id4	0	~	1
154	Integer	R	control, state of cooling mode	0	~	1
155	Integer	R	control, state of dead zone	0	~	1
156	Integer	R	control, state of heating mode	0	~	1
157	Analog	R/W	economizer, temperature threshold for activation night refreshment function	8,0	22,0	35,0
158	Analog	R/W	control, low supply limit threshold in cooling mode	3,0	12,0	68,0
159	Analog	R/W	control, high supply limit threshold in heating mode	30,0	38,0	68,0
160	Analog	R/W	control, room temperature threshold for unloading cooling mode	0,0	26,0	30,0
161	Analog	R/W	control, room temperature threshold for unloading heating mode	0,0	19,0	30,0
162	Analog	R/W	economizer, outside lower temperature threshold for unloading frre-cooling	-20,0	-20,0	50,0
163	Analog	R/W	economizer, outside upper temperature threshold for unloading free-cooling	-20,0	26,0	50,0
164	Analog	R/W	circuit, outside temperature threshold for unloading 50% in cooling mode	-10,0	20,0	50,0
165	Analog	R/W	circuit, outside temperature threshold for unloading 100% in cooling mode	-10,0	12,0	50,0
166	Analog	R/W	circuit, outside temperature threshold for unloading 50% in heating mode	-20,0	-20,0	50,0
167	Analog	R/W	circuit, outside temperature threshold for unloading 100% in heating mode	-20,0	-20,0	50,0
168	Analog	R/W	heaters, outside temperature threshold for unloading	-20,0	10,0	50,0
169	Integer	R/W	1st heaters, bms night, set point for priority inversion starting	0	0	3
170	Integer	R/W	1st heaters, bms day, set point for priority inversion starting	0	0	3
171	Analog	R/W	1st heaters, outside temperature threshold for inversion starting	-20,0	10,0	50,0
172	Integer	R/W	2nd heaters, bms night, set point for priority inversion starting	0	0	1
173	Integer	R/W	2nd heaters, bms day, set point for priority inversion starting	0	0	1
174	Analog	R/W	power meter, current threshold for unloaded 50% of compressors running	0,0	999,9	999,9
175	Integer	R	circuit 3 compressor 1, state	0,0	~	1,0
176	Integer	R	circuit 3, state of the reversing valve (heating mode)	0,0	~	1,0
177	Integer	R	clock, state of the schedule (zone.mode)	0,0	~	6,5
178	Integer	R	2nd heaters, power percentage calculated for the triac	0,0	~	100,0
179	Integer	R	hot water recovery, opening percentage calculated for the valve	0,0	~	100,0
180	Integer	R/W	master/slaves, setting the sub-bus	1	1	24
181	Analog	R	blower, speed percentage calculated for the inverter	0,0	~	100,0
182	Integer	R	control, count value (weight low) of operating time in cooling mode	0	~	65536
183	Integer	R	control, count value (weight high) of operating time in cooling mode	0	~	65536
184	Integer	R	control, count value (weight low) of operating time in heating mode	0	~	65536
185	Integer	R	control, count value (weight high) of operating time in heating mode	0	~	65536
186	Integer	R	cold water coil, opening percentage calculated for the valve	0,0	~	100,0
187	Integer	R/W	economizer, minimum threshold for air quality control	0	1000	2000
188	Integer	R/W	economizer, maximum threshold for air quality control	0	1500	2000

APPENDIX 2
Lonworks

NV_Name	DESCRIPTION	MIN	FACT.	MAX
nvi_Watchdog	[BMS] Watchdog	0	0	32767
nvo_Watchdog				
nvo_Alarm_Codes	Alarm Codes	0	~	999
nvo_Ventilateur de traitement_Qv	[Flow] Calculated by Climatic	0	~	32767
nvo_Ventilateur de traitement_dP	Sensor: Air flow	0	~	1000
nvo_Room_Temp	Value: Temperature - Room	-99.9	~	99.9
nvo_Outside_Temp	Value: Temperature - Outdoor	-99.9	~	99.9
nvo_Supply_Temp	Sensor: Temperature - Supply	-99.9	~	99.9
nvo_Room_Hr	Value: humidity - Room	0.0	~	100.0
nvo_Outside_Hr	Value: Humidity - Outdoor	0.0	~	100.0
nvo_CO2	Value: Air quality	0	~	2000
nvi_Contrôle_Temp	Set point: Control Temperature (Customer)	8.0	20.5	35.0
nvo_Contrôle_Temp				
nvo_Contrôle_Cool	Set point: Control in cooling	8.0	~	35.0
nvo_Contrôle_Heat	Set point: Control in heating	8.0	~	35.0
nvi_Day_Cool	[BMS] Set point: Room in cooling	8.0	22.0	35.0
nvo_Day_Cool				
nvi_Day_Heat	[BMS] Set point: Room in heating	8.0	19.0	35.0
nvo_Day_Heat				
nvi_Night_Cool	[D] 'Night' Set point: Room in cooling	8.0	35.0	35.0
nvo_Night_Cool				
nvi_Night_Heat	[D] 'Night' Set point: Room in heating	8.0	15.0	35.0
nvo_Night_Heat				
nvi_Day_Air_Mini	[BMS] Minimum: Open air damper	0.0	20.0	100.0
nvo_Day_Air_Mini				
nvi_Sends_Room_T	[BMS] Emulation: Room temperature	-99.9	-99.9	99.9
nvi_Sends_Out_T	[BMS] Emulation: Outdoor temperature	-99.9	-99.9	99.9
nvi_Sends_Room_H	[BMS] Emulation: Room humidity	0	0	100
nvi_Sends_Out_H	[BMS] Emulation: Outdoor humidity	0	0	100
nvi_Sends_CO2	[BMS] Emulation: Air quality sensor	0	0	2000
nvi_Sends_Speed	[BMS] Command: Fan speed - Blower	0.0	0.0	100.0
nvo_PM_kW	Power Meter: Real power	0	~	65536
nvo_PM_kVA	Power Meter: Reactive power	0	~	65536
nvo_PM_Pw_Factor	Power Meter: Power factor	0	~	65536
nvo_PM_kWh_LSB	LSB: Power Meter: Real energy	0	~	65536
nvo_PM_kWh_MSB	MSB: Power Meter: Real energy	0	~	65536
nvo_PM_kVAh_LSB	LSB: Power Meter: Reactive energy	0	~	65536
nvo_PM_kVAh_MSB	MSB: Power Meter: Reactive energy	0	~	65536
nvi_PM_Reset	[BMS] Power Meter: Code for reset	0	0	65536
nvo_Fresh_Air	Output: Air damper	0.0	~	100.0
nvo_Compresseur	Output: Modulating compressor	0.0	~	100.0
nvo_Heaters_1	Output: Modulating heaters 1	0.0	~	100.0
nvo_Heaters_2	Output: Modulating heaters 2	0.0	~	100.0
nvo_Paramétrable_T_1	External signal: Custom temp. - 1st	-99.9	~	99.9
nvo_Paramétrable_T_2	External signal: Custom temp. - 2nd	-99.9	~	99.9
nvo_Paramétrable_T_3	External signal: Custom temp. - 3rd	-99.9	~	99.9
nvo_Paramétrable_T_4	External signal: Custom temp. - 4th	-99.9	~	99.9

NV_Name	DESCRIPTION	MIN	FACT.	MAX
nvo_Error_Bits_1	[Alarm - Major]	0	~	65536
	bit.0 = (70) Real Time Clock			
	bit.1 = (71) BE.1, Communication Bus			
	bit.2 = (72) BE.2, Communication Bus			
	bit.3 =			
	bit.4 = (81) Room Temperature, Probe			
	bit.5 = (82) Room Humidity, Sensor			
	bit.6 = (83) Outside Temperature, Probe			
	bit.7 = (85) Supply Temperature, Probe			
	bit.8 = (88) Return Temperature, Probe			
	bit.9 = (22) Supply Temperature, Too Low			
	bit.10 = (80) Air Flow, Sensor			
	bit.11 = (73) Blower, Inverter, Com. Bus			
	bit.12 = (1) Blower, Flow Switch Cut Off			
	bit.13 = (91) Blower, Fan			
	bit.14 = (92) Blower, Inverter			
	bit.15 = (99) Fire / Smoke, Detected			
nvo_Error_Bits_2	[Alarm - Major]	0	~	65536
	bit.0 = (74) Exhaust, Inverter, Com. Bus			
	bit.1 = (93) Exhaust, Fan			
	bit.2 = (94) Exhaust, Inverter			
	bit.3 =			
	bit.4 = (59) Recovery, Outlet Temp., Probe			
	bit.5 = (56) Recovery, Air Flow, Sensor			
	bit.6 = (51) Recovery, Motor			
	bit.7 = (52) Recovery, Wheel			
	bit.8 =			
	bit.9 = (13) Hot Water, Risk Of Frosting			
	bit.10 = (41) Pump 1, Electrical			
	bit.11 = (11) Electrical Heaters, Overheating			
	bit.12 = (12) Fresh Air, Electrical Heater, Overheating			
	bit.13 = (14) Gas Burner 1			
	bit.14 = (15) Gas Burner 2			
	bit.15 = (16) Gas Burner, Overheating			
nvo_Error_Bits_3	[Alarm - Major]	0	~	65536
	bit.0 = (141) Circuit 1, High Pressure, Sensor			
	bit.1 = (142) Circuit 1, Low Presure, Sensor			
	bit.2 = (143) Circuit 1, Liquid Temp., Probe			
	bit.3 = (144) Circuit 1, Suction Temp., Probe			
	bit.4 = (114) Circuit 1, Compressor, Electrical			
	bit.5 = (115) Circuit 1, High Pressure Cut Off			
	bit.6 = (116) Circuit 1, Rever. Valve, Blocked			
	bit.7 = (117) Circuit 1, Low Pressure Cut Off			
	bit.8 = (118) Circuit 1, Risk Of Frosting			
	bit.9 = (132) Circuit 1, Exp. Valve, Motor			
	bit.10 = (75) Circuit 1, Cond.Fan, Inverter, Bus			
	bit.11 = (102) Circuit 1, Condenser Fan			
	bit.12 = (103) Circuit 1, Condenser Fan, Inverter			
	bit.13 = (86) Water Condenser, Inlet, Probe			
	bit.14 = (87) Water Condenser, Outlet, Probe			
	bit.15 =			

NV_Name	DESCRIPTION	MIN	FACT.	MAX
nvo_Error_Bits_4	[Alarm - Major]	0	~	65536
	bit.0 = (241) Circuit 2, High Pressure, Sensor			
	bit.1 = (242) Circuit 2, Low Presure, Sensor			
	bit.2 = (243) Circuit 2, Liquid Temperature, Probe			
	bit.3 = (244) Circuit 2, Suction Temperature, Probe			
	bit.4 = (214) Circuit 2, Compressor, Electrical			
	bit.5 = (215) Circuit 2, High Pressure Cut Off			
	bit.6 = (216) Circuit 2, Reversing Valve, Blocked			
	bit.7 = (217) Circuit 2, Low Pressure Cut Off			
	bit.8 = (218) Circuit 2, Risk Of Frosting			
	bit.9 = (232) Circuit 2, Expansion Valve, Motor			
	bit.10 = (76) Circuit 2, Condenser Fan, Inverter, Communication Bus			
	bit.11 = (202) Circuit 2, Condenser Fan			
	bit.12 = (203) Circuit 2, Condenser Fan, Inverter			
	bit.13 = (2) Water Condenser, Flow Switch Cut Off			
	bit.14 = (25) Water Condenser Temperature, Too Low			
	bit.15 = (26) Water Condenser Temperature, Too High			
nvo_Error_Bits_5	[Alarm - Minor]	0	~	65536
	bit.0 = (84) Outside Humidity, Sensor			
	bit.1 = (23) Room Temperature, Too High			
	bit.2 = (24) Room Temperature, Too Low			
	bit.3 = (32) Room Humidity, Too Low			
	bit.4 = (33) Room Humidity, Too High			
	bit.5 = (21) Supply Temperature, Too High			
	bit.6 = (4) Blower, Filters, Dirty			
	bit.7 = (5) Blower, Filters, Missing			
	bit.8 = (89) Air Quality, Sensor			
	bit.9 = (29) Air Quality, Too High			
	bit.10 = (54) Recovery, Filters, Dirty			
	bit.11 = (31) Humidifier, Failure			
	bit.12 =			
	bit.13 =			
	bit.14 = (110) Circuit 1, Leak Refrigerant, Detected			
	bit.15 = (210) Circuit 2, Leak Refrigerant, Detected			

NV_Name	DESCRIPTION	MIN	FACT.	MAX
	[Alarm - Minor]			
	bit.0 = (119) Circuit 1, Low Condensing Temperature			
	bit.1 = (129) Circuit 1, High Condensing Temperature			
	bit.2 = (128) Circuit 1, LOP, Low Operating Pressure			
	bit.3 = (127) Circuit 1, MOP, Maximum Operating Pressure			
	bit.4 = (121) Circuit 1, Low Superheat			
	bit.5 = (122) Circuit 1, High Superheat			
	bit.6 = (123) Circuit 1, Low Subcooling			
nvo_Error_Bits_6	bit.7 = (124) Circuit 1, High Subcooling	0	~	65536
	bit.8 = (219) Circuit 2, Low Condensing Temperature			
	bit.9 = (229) Circuit 2, High Condensing Temperature			
	bit.10 = (228) Circuit 2, LOP, Low Operating Pressure			
	bit.11 = (227) Circuit 2, MOP, Maximum Operating Pressure			
	bit.12 = (221) Circuit 2, Low Superheat			
	bit.13 = (222) Circuit 2, High Superheat			
	bit.14 = (223) Circuit 2, Low Subcooling			
	bit.15 = (224) Circuit 2, High Subcooling			
nvi_Bool_Bits_1	[Digital]			
	bit.0 = Activation: Power unit (On/Off)		0	
	bit.1 = Reset: Alarms and safety		0	
	bit.2 = [BMS] Forcing: Mode daily [D] 'Night'		0	
	bit.3 = [BMS] Activation: Blower in deadzone		1	
	bit.4 =		~	
	bit.5 =		~	
	bit.6 =		~	
nvo_Bool_Bits_1	bit.7 =	0	~	65536
	bit.8 =		~	
	bit.9 =		~	
	bit.10 = [BMS] Relay: BM J14 N7		0	
	bit.11 = [BMS] Relay: BM J15 N12		0	
	bit.12 = [BMS] Relay: BE-1 J5 N1		0	
	bit.13 = [BMS] Relay: BE-1 J6 N2		0	
	bit.14 = [BMS] Relay: BE-1 J7 N3		0	
	bit.15 = [BMS] Relay: BE-1 J8 N4		0	
nvi_Bool_Bits_2	[Digital]	0		65536

NV_Name	DESCRIPTION	MIN	FACT.	MAX
nvo_Bool_Bits_2	bit.0 = [BMS] Unload: Control in cooling mode		0	
	bit.1 = [BMS] Unload: Control in heating mode		0	
	bit.2 = [BMS] Forcing: Fan speed - Low flow		0	
	bit.3 = [BMS] Forcing: Fan speed - Nominal flow		0	
	bit.4 = [BMS] Unload: Air quality control		0	
	bit.5 = [BMS] Forcing: Closing air damper		0	
	bit.6 = [BMS] Forcing: Open air damper		0	
	bit.7 = [BMS] Unload: Free-Cooling		0	
	bit.8 = [BMS] Unload: Free-Heating		0	
	bit.9 = [BMS] Unload: 50% compressor running		0	
	bit.10 = [BMS] Unload: Compressor		0	
	bit.11 = [BMS] Unload: Compressor in heating		0	
	bit.12 = [BMS] Request: Delay Defrost		0	
	bit.13 = [BMS] Unload: 50% heaters running		0	
	bit.14 = [BMS] Unload: Heaters		0	
	bit.15 =		~	
nvo_Bool_Bits_3	[Digital]	0	~	65536
	bit.0 = Output: Alarm			
	bit.1 = Output: Blower			
	bit.2 = Output: Exhaust fan - 1st			
	bit.3 = Output: Compressor 1 - Circuit 1			
	bit.4 = Output: Compressor 2 - Circuit 1			
	bit.5 = Output: Reversing Valve - Circuit 1			
	bit.6 = Output: Compressor 1 - Circuit 2			
	bit.7 = Output: Compressor 2 - Circuit 2			
	bit.8 = Output: Reversing Valve - Circuit 2			
	bit.9 = Output: Gas burner - 1st			
	bit.10 = Output: Gas burner - 2nd			
	bit.11 = Output: Gas burner - Full Power			
	bit.12 = Output: Electrical heaters - 1st			
	bit.13 = Output: Electrical heaters - 2nd			
	bit.14 =			
	bit.15 =			

NV_Name	DESCRIPTION	MIN	FACT.	MAX
nvo_Bool_Bits_4	[Digital]	0	~	65536
	bit.0 = Unit: Power unit status (On/Off)			
	bit.1 = Control: Cooling mode			
	bit.2 = Control: Dead Zone			
	bit.3 = Control: Heating mode			
	bit.4 =			
	bit.5 =			
	bit.6 =			
	bit.7 =			
	bit.8 =			
	bit.9 =			
	bit.10 = Input: Custom - BM J4 ID4			
	bit.11 = Input: Custom - BM J4 ID7			
	bit.12 = Input: Custom - BE1 J4 ID1			
	bit.13 = Input: Custom - BE1 J4 ID2			
	bit.14 = Input: Custom - BE1 J4 ID3			
	bit.15 = Input: Custom - BE1 J4 ID4			

APPENDIX 3
Digital inputs

	Small	Medium
BM60:J4.ID1		**Gas, Valve 1, Status** [ELHS][ELHH] **Electrical Heaters, Status** [HWCH] **Hot/Water Coil, Antifreeze Sensor**
BM60:J4.ID2		**Circuit 1, Compressors, Status**
BM60:J4.ID3		**Circuit 1, Condenser Fan, Status** Water Condenser, Flow switch
BM60:J4.ID4		[ELPS][ELPH] **Electrical Heaters, Fresh Air, Status** Remote control : Custom
BM60:J4.ID5		[DADS] **Fire/Smoke Detector**
BM60:J4.ID6		**Blower, Status**
BM60:J4.ID7		[HRMO] **Static Recovery, Switch Air** Remote control : Custom
BM60:J16.ID8	**X**	**Gas, Valve 2, Status** or Hot/Water Pump, Status
BM60:J16.ID9	**X**	Circuit 2, **Compressors, Status**
BM60:J16.ID10	**X**	Circuit 2, **Condenser Fan, Status**
BE60.1:J4.ID1		[DCBO] Remote control : Custom
BE60.1:J4.ID2		[DCBO] Remote control : Custom
BE60.1:J4.ID3		[DCBO] Remote control : Custom
BE60.1:J4.ID4		[DCBO] Humidifier, Status or Remote control : Custom
BE60.2:J4.ID1		**Wheel Recovery, Motor Status**
BE60.2:J4.ID2		
BE60.2:J4.ID3		
BE60.2:J4.ID4		

APPENDIX 4
Digital outputs

<table>
<tr><th></th><th>Small</th><th>Medium</th></tr>
<tr><td>BM60:J12.NO1</td><td colspan="2">Circuit 1, Compressor 1</td></tr>
<tr><td>BM60:J12.NO2</td><td colspan="2">Circuit 1, Compressor 2</td></tr>
<tr><td>BM60:J12.NO3</td><td colspan="2">Circuit 1, Condenser Fan</td></tr>
<tr><td>BM60:J13.NO4</td><td>Circuit 1, Reversing Valve</td><td>Circuit 2, Compressor 1</td></tr>
<tr><td>BM60:J13.NO5</td><td>Blower</td><td>Circuit 2, Compressor 2</td></tr>
<tr><td>BM60:J13.NO6</td><td>Gas, Valve 1 or [ELHS][ELHH] Electrical Heaters, 1</td><td>Circuit 2, Condenser Fan</td></tr>
<tr><td>BM60:J14.NO7</td><td colspan="2" rowspan="2">Gas, Valve 2 or [ELHS][ELHH] Electrical Heaters, 2 or Reversing Hot/Water <> Cold/Water or Remote control : Custom</td></tr>
<tr><td>BM60:J14.NC7</td></tr>
<tr><td>BM60:J15.NO8</td><td></td><td>Gas, Valve 1
[ELHS][ELHH] Electrical Heaters, 1 or Hot/ Water Pump</td></tr>
<tr><td>BM60:J15.NO9</td><td></td><td>Circuit 1, Reversing Valve</td></tr>
<tr><td>BM60:J15.NO10</td><td></td><td>Circuit 2, Reversing Valve</td></tr>
<tr><td>BM60:J15.NO11</td><td></td><td>Blower</td></tr>
<tr><td>BM60:J15.NO12</td><td></td><td>Remote control : Custom</td></tr>
<tr><td>BE60.1:J5.NO1</td><td colspan="2" rowspan="2">[PEFA] Exhaust Fan 1 or [DCBO] Remote control : Custom</td></tr>
<tr><td>BE60.1:J5.NC1</td></tr>
<tr><td>BE60.1:J6.NO2</td><td colspan="2" rowspan="2">[LAKI] Circuit 1, Condenser Fan Low Speed or Exhaust Fan 2 or [DCBO] Remote control : Custom</td></tr>
<tr><td>BE60.1:J6.NC2</td></tr>
<tr><td>BE60.1:J7.NO3</td><td colspan="2" rowspan="2">[LAKI] Circuit 2, Condenser Fan Low Speed or Exhaust Fan 3 or [DCBO] Remote control : Custom</td></tr>
<tr><td>BE60.1:J7.NC3</td></tr>
<tr><td>BE60.1:J8.NO4</td><td colspan="2" rowspan="2">[DCBO] Humidifier or [DCBO] Remote control : Custom</td></tr>
<tr><td>BE60.1:J8.NC4</td></tr>
<tr><td>BE60.2:J5.NO1</td><td colspan="2" rowspan="8">Wheel Recovery, Motor</td></tr>
<tr><td>BE60.2:J5.NC1</td></tr>
<tr><td>BE60.2:J6.NO2</td></tr>
<tr><td>BE60.2:J6.NC2</td></tr>
<tr><td>BE60.2:J7.NO3</td></tr>
<tr><td>BE60.2:J7.NC3</td></tr>
<tr><td>BE60.2:J8.NO4</td></tr>
<tr><td>BE60.2:J8.NC4</td></tr>
</table>

APPENDIX 5
Analogic inputs

	Small	Medium
BM60:J3.B1 (NTC)	**Return** or ***Room*** (NTC)	**Return** (NTC)
BM60:J3.B2 (NTC)	**Outside** (NTC)	
BM60:J3.B3 (NTC)	**Supply** (NTC)	
BM60:J3.B4 (NTC)	**Circuit 1, Suction** (NTC)	
BM60:J3.B5 (NTC, 4-20)	**Circuit 1, Condensing -1~45b** (4~20mA)	
BM60:J3.B6 (NTC, 0-5)	**Circuit 1, Evaporating -1~20b** (0~5V)	
BM60:J3.B7 (NTC, 0-5)	**Filters/Fan 0~500 Pa** (0~5V) or ***Room*** (NTC)	
BM60:J18.B8 (NTC)	**X**	[RLKD] **Circuit 2, Liquid** (NTC)
BM60:J18.B9 (NTC)	**X**	**Circuit 2, Suction** (NTC)
BM60:J18.B10 (NTC, 4-20)	**X**	Circuit 2, **Condensing -1~45b** (4~20mA)
BM60:J18.B11 (NTC, 0-5)	**X**	Circuit 2, **Evaporating -1~120b** (0~5V)
BM60:J18.B12 (NTC, 0-5)	**X**	**Room** (NTC)
DC60 Modbus	[DC60] **Room, Temperature**	
Hr Modbus	[ADCP] **Room, Temperature**	
Hr Modbus	[ADCP] **Room, Humidity**	
BE60.1:J9.B1	[CO2S] **Indoor, Air Quality CO_2** (4~20mA) or [DCBO] Remote control: Custom	
BE60.1:J9.B2	[ADCP] **Outside, Humidity** (4~20mA) or [DCBO] Remote control: Custom	
BE60.1:J10.B3	[RLKD] **Circuit 1, Liquid** (NTC) or Water Condenser, Inlet (NTC) or [DCBO] Remote control : Custom	
BE60.1:J10.B4	Water Condenser, Outlet (NTC) or [DCBO] Remote control : Custom	
BE60.2:J9.B1	**Wheel Recovery, Pressure** (0~5V)	
BE60.2:J9.B2		
BE60.2:J10.B3	**Outside** (NTC)	
BE60.2:J10.B4		

APPENDIX 6
Analogic outputs

	Small	Medium
BM60:J5.Y1	Economizer (0~10V) or Cold/Water Coil, Valve (0~10V)	
BM60:J5.Y2	[HWCH] Hot/Water Coil, Valve (0~10V) or Cold/Water Coil, Valve (0~10V) or [ELHH] Electrical Heaters (Triac 0~5V) or [MOGB] Gas Modulation (0~10V)	
BM60:J5.Y3	[ELPS][ELPH] Electric Heaters Fresh Air (Triac 0~5V) or [ENRE] Hot/Water Recovery, Valve (0~10V) or [HRMO] Static Recovery, By-Pass (0~10V)	
BM60:J5.Y4	X	Circuit 1, Compressor Digital (0-5V)
BE60.1:J2.Y1	Water Condenser, Valve (0~10V) or [DCBO] Humidifier (0~10V)	
BE60.2:J2.Y1	Recovery, Damper (0~10V)	

APPENDIX 7
Serial port

SERIAL PORT			
J6	Option	Unit	BMS Customer Bus
J7		Unit	DS60 Terminal Display
J8		Unit	CL60 external Bus
J9			
J10		Unit	CL60 internal Bus

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
1111	alarm historic	Alarm	***	***	Historical				
2111	general on/off, start & stop unit, set point	User	Unit	General	On/Off	R/W	0	0	1
2112	start & stop unit, state of customized dry contact				On/Off iD	R	0	0	1
2113	reset alarms, state of customized dry contact				Reset iD	R	0	0	1
2121	hour clock setting	User	Unit	Clock	Hour	R/W	0	0	23
2122	minute clock setting				Minute	R/W	0	0	59
2123	day clock setting				Day	R/W	1	1	31
2124	month clock setting				Month	R/W	1	1	12
2125	year clock setting				Year	R/W	0	0	99
2126	automatic change of summer/winter hour				Win/Sum	R/W	0	0	1
2131	Status of this function	User	Unit	Schedule	Status	R	23	23	62
2132	Actual Zone				Zone	R	0	0	6
2133	Actual Mode				Mode	R	0	0	6
2134	setting of the number of zone				Nbr Zone	R	0	3	6
2135	setting of the number of mode				Nbr Mode	R	0	2	6
2136	night' mode forced by BMS				Bms Night	R/W	0	0	1
2137	BMS' mode activated				Bms Mode	R/W	0	0	1
2141	start time for zone 0, always 00h00	User	Unit	Schedule Time	Time Z0	R/Z	0	0	0
2142	start time for zone 1, set point				Time Z1	R/W/Z	0	6	24
2143	start time for zone 2, set point				Time Z2	R/W/Z	0	22	24
2144	start time for zone 3, set point				Time Z3	R/W/Z	0	24	24
2145	start time for zone 4, set point				Time Z4	R/W/Z	0	24	24
2146	start time for zone 5, set point				Time Z5	R/W/Z	0	24	24
2147	start time for zone 6, set point				Time Z6	R/W/Z	0	24	24
2151	mode for zone 0, set point	User	Unit	Schedule Mode	Mode Z0	R/W/Z	1	4	4
2152	mode for zone 1, set point				Mode Z1	R/W/Z	1	3	4
2153	mode for zone 2, set point				Mode Z2	R/W/Z	1	4	4
2154	mode for zone 3, set point				Mode Z3	R/W/Z	1	4	4
2155	mode for zone 4, set point				Mode Z4	R/W/Z	1	4	4
2156	mode for zone 5, set point				Mode Z5	R/W/Z	1	4	4
2157	mode for zone 6, set point				Mode Z6	R/W/Z	1	4	4
2161	outside air temperature threshold to activate function	User	Unit	Anticipation	Onset	R/W	-10	1	20
2162	gradient (slope)				Slope	R/W	0	0	100
2171	state of the relay, bm n7	User	Unit	Cust. Relay	Bm-N7	R	0	0	1
2172	state of the relay, bm n12				Bm-N12	R	0	0	1
2173	state of the relay, be-1 n1				Be.1-N1	R	0	0	1
2174	state of the relay, be-1 n2				Be.1-N2	R	0	0	1
2175	state of the relay, be-1 n3				Be.1-N3	R	0	0	1
2176	state of the relay, be-1 n4				Be.1-N4	R	0	0	1

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2181	state of the dry contact, bm id4	User	Unit	Cust. Switch	Bm-iD4	R	0	0	1
2182	state of the dry contact, bm id7				Bm-iD7	R	0	0	1
2183	state of the dry contact, be-1 id1				Be.1-iD1	R	0	0	1
2184	state of the dry contact, be-1 id2				Be.1-iD2	R	0	0	1
2185	state of the dry contact, be-1 id3				Be.1-iD3	R	0	0	1
2186	state of the dry contact, be-1 id4				Be.1-iD4	R	0	0	1
2191	value of the signal, be-1 b1	User	Unit	Cust. Signal	Be.1-B1	R	-5	0	5
2192	value of the signal, be-1 b2				Be.1-B2	R	-5	0	5
2193	value of the signal, be-1 b3				Be.1-B3	R	-5	0	5
2194	value of the signal, be-1 b4				Be.1-B4	R	-5	0	5
2211	value of the outside temperature	User	Control	Temperature	Outside	R	-99,9	0	99,9
2212	Origin of the Value (BM, BE, BUS, Mast/Slav or BMS)				From	R	23	23	62
2213	value of the room temperature				Room	R	-99,9	0	99,9
2214	Origin of the Value (BM, BE, BUS, Mast/Slav or BMS)				From	R	23	23	62
2215	value of the supply temperature				Supply	R	-99,9	0	99,9
2216	value of the return temperature				Return	R	-99,9	0	99,9
2221	value of the room temperature	User	Control	Room	Temp.	R	-99,9	0	99,9
2222	customer (dc/dm) set point				Sp Cust.	R/W	8	20,5	35
2223	set value of cooling mode				Set Cool.	R	8	19	35
2224	set value of heating mode				Set Heat.	R	8	22	35
2225	states of cooling mode				State.C	R	23	23	62
2226	states of heating mode				State.H	R	23	23	62
2227	power factor of cooling mode				Pf.Cool.	R	0	0	100
2228	power factor of heating mode				Pf.Heat.	R	0	0	100
2231	value of the supply temperature	User	Control	Supply	Temp.	R	-99,9	0	99,9
2232	Blowing air temperature set point				Setting	R	1	20,5	70
2233	activation of the smoothing function of temperature				Smooth	R/Z	0	0	1
2234	count value of cooling operating time				Time.Cool	R	0	0	9999
2235	count value of heating operating time				Time.Heat	R	0	0	9999
2241	Dynamic set point (cooling setpoint offset according to outside temperature)	User	Control	Room Sp	Sp.Dyna.	R/W/Z	0	20	20
2242	set point of cooling mode				Sp.Cool.	R/W/Z	8	19	35
2243	set point of heating mode				Sp.Heat.	R/W/Z	8	22	35
2244	outdoor temperature low threshold for room temperature setpoint slope				Out.Low	R/W	-20	0	50
2245	room temp setpoint offset according to low outdoor air temp				Coef.Low	R/W	-50	0	50
2246	outdoor temperature high threshold for slope on the room temperature setpoint				Out.High	R/W	-20	30	50
2247	room temp setpoint offset according to high outdoor air temp				Coef.High	R/W	-50	0	50
2248	room temperature threshold for unloading cooling mode				Limit C.	R/W	0	0	40
2249	room temperature threshold for unloading heating mode				Limit H.	R/W	0	40	40

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2251	low limit threshold in cooling mode	User	Control	Supply Sp	Lim.Cool	R/W	4	12	38
2252	high limit threshold in heating mode				Lim.Heat	R/W	4	38	38
2253	offset for high limit threshold in cooling mode				Adj.Cool	R/W	-5	0	5
2254	offset for low limit threshold in heating mode				Adj.Heat	R/W	-5	0	5
2255	outdoor temperature low threshold for slope on the supply temperature setpoint				Out.Low	R/W	-20	0	50
2256	coefficient of the low outside temperature for the slope of the supply temperature setpoint				Coef.Low	R/W	-50	0	50
2257	outdoor temperature high threshold for slope on the supply temperature setpoint				Out.High	R/W	-20	30	50
2258	coefficient of the high outside temperature for the slope of the supply temperature setpoint				Coef.High	R/W	-50	0	50
2261	value of the outside humidity	User	Control	Humidity	Outside	R	0	0	100
2262	calculated value of the outside absolute humidity				Absol.	R	0	0	99,9
2263	from the value				From	R	23	23	62
2264	value of the room humidity				Room	R	0	0	100
2265	calculated value of the room absolute humidity				Absol.	R	0	0	99,9
2266	from the value				From	R	23	23	62
2267	power factor of dehumidification function				Pf.Deh.	R	0	0	100
2268	power factor of humidification				Pf.Hum.	R	0	0	100
2269	state of enthalpy control				Enthalpy	R	0	0	1
2271	set point of dehumidification	User	Control	Humidity Sp	Sp. Deh.	R/W/Z	0	10	100
2272	set point of humidification				Sp. Hum.	R/W/Z	0	0	100
2281	activation of tcb feature	User	Control	Tcb	Mode	R/W	0	0	1
2282	state of 'g' signal				- G	R	0	0	1
2283	state of 'b' signal				- B	R	0	0	1
2284	state of 'y1' signal				- Y1	R	0	0	1
2285	state of 'y2' signal				- Y2	R	0	0	1
2286	state of 'w1' signal				- W1	R	0	0	1
2287	state of 'w2' signal				- W2	R	0	0	1
2311	state of configuration	User	Blower	Fan	Config.	R	0	0	21
2312	states of management				Status	R	23	23	62
2313	state of the auxiliary contact				State iD	R	0	0	1
2314	state of the relay				Relay	R	0	0	1
2315	count value of operating time				Run Time	R	0	0	9999
2316	setpoint for activation operation of component				Enabled	R/W/Z	0	1	1
2317	setpoint for activation operation in room control dead zone				Dead Z.	R/W/Z	0	1	1
2318	temperature threshold for activation night refreshment function				Night Eco	R/W	8	22	35
2321	state of configuration	User	Blower	Speed	Config.	R	0	0	21
2322	states of management				Status	R	23	23	62
2323	state of the safety contact of inverter				State iD	R	0	0	1
2324	speed percentage calculated for the inverter				Inverter	R	0	0	100
2325	speed percentage send to the inverter				Output	R	0	0	24000
2326	calculated value of air flow or evaporator flow switch				Flow	R	0	0	24000
2327	choice of speed function				Function	R/W	0	0	2
2328	nominal threshold for air flow control				Flow H.	R/W	0	85	100
2329	low threshold for air flow control				Flow L.	R/W	0	33	100
2331	state of configuration	User	Blower	Air Flow	Config.	R	0	0	21
2332	value of differential pressure sensor on air flow				Delta dP	R	0	0	1000
2333	air flow threshold alarm				Air Flow	R/W	0	25	1000
2334	filters missing threshold alarm				Missing	R/W	0	50	1000
2335	dirty filters threshold alarm				Dirty	R/W	50	250	1000
2341	state of smoke detection contact	User	Blower	Safety	Fire iD	R	0	0	1
2411	state of configuration				Config.	R	0	0	21

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2412	value of the evaporating pressure or temperature	User	Compressor	Circuit 1	Evap.	R	-1	-1	20
2413	value of the suction temperature				Suction	R	-99,9	0	99,9
2414	value of the condensing pressure or temperature				Cond.	R	-1	-1	45
2415	value of the liquide temperature				Liquid	R	-99,9	0	99,9
2416	low pressure, state of the safety				Low P.	R	0	0	1
2417	state of the reversing valve				R.Valve	R	0	0	1
2418	speed percentage calculated for the inverter				Inverter	R	0	0	100
2419	speed percentage send to the inverter				Output	R	0	0	1
2421	state of configuration	User	Compressor	Circ.1 Comp.1	Config.	R	0	0	21
2422	states of management				Status	R	23	23	62
2423	state of the auxiliary contact				State iD	R	0	0	1
2424	state of the relay				Relay	R	0	0	1
2425	count value of operating time				Run Time	R	0	0	9999
2431	state of configuration	User	Compressor	Circ.1 Comp.2	Config.	R	0	0	21
2432	states of management				Status	R	23	23	62
2433	state of the auxiliary contact				State iD	R	0	0	1
2434	state of the relay				Relay	R	0	0	1
2435	count value of operating time				Run Time	R	0	0	9999
2441	state of configuration	User	Compressor	Circuit 2	Config.	R	0	0	21
2442	value of the evaporating pressure or temperature				Evap.	R	-1	-1	20
2443	value of the suction temperature				Suction	R	-99,9	0	99,9
2444	value of the condensing pressure or temperature				Cond.	R	-1	-1	45
2445	value of the liquide temperature				Liquid	R	-99,9	0	99,9
2446	low pressure, state of the safety				Low P.	R	0	0	1
2447	state of the reversing valve				R.Valve	R	0	0	1
2451	state of configuration	User	Compressor	Circ.2 Comp.1	Config.	R	0	0	21
2452	states of management				Status	R	23	23	62
2453	state of the auxiliary contact				State iD	R	0	0	1
2454	state of the relay				Relay	R	0	0	1
2455	count value of operating time				Run Time	R	0	0	9999
2461	state of configuration	User	Compressor	Circ.2 Comp.2	Config.	R	0	0	21
2462	states of management				Status	R	23	23	62
2463	state of the auxiliary contact				State iD	R	0	0	1
2464	state of the relay				Relay	R	0	0	1
2465	count value of operating time				Run Time	R	0	0	9999

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2471	setpoint for activation operation of all compressor, cooling/heating mode	User	Compressor	Mode	Enabled	R/W/Z	0	1	1
2472	enable circuit 1, separate comp.1 or/and comp.2				Enable.1	R/W	0	3	3
2473	enable circuit 2, separate comp.1 or/and comp.2				Enable.2	R/W	0	3	3
2481	setpoint for activation operation in cooling mode	User	Compressor	Cooling	Enabled	R/W/Z	0	1	1
2482	outside air temperature threshold, unload 50% of compressors				Low L50%	R/W	-10	20	50
2483	outside air temperature threshold, unload 100% of compressors				Low L.	R/W	-10	12	50
2491	setpoint for activation operation in heating mode	User	Compressor	Heating	Enabled	R/W/Z	0	1	1
2492	outside air temperature threshold, unload 50% of compressors				Low L50%	R/W	-20	-20	50
2493	outside air temperature threshold, unload 100% of compressors				Low L.	R/W	-20	-20	50
2511	state of configuration	User	Condenser	Circuit 1	Config.	R	0	0	21
2512	value of the condensing temperature				Cond.	R	-99,9	0	99,9
2513	condensing temperature set point				Setting	R	25	30	45
2514	states of management				Status	R	23	23	62
2515	state of the auxiliary contact				State iD	R	0	0	1
2516	state of the relay				Relay	R	0	0	1
2517	speed percentage calculated for the inverter				Inverter	R	0	0	100
2521	state of configuration	User	Condenser	Circuit 2	Config.	R	0	0	21
2522	value of the condensing temperature				Cond.	R	-99,9	0	99,9
2523	condensing temperature set point				Setting	R	25	30	45
2524	states of management				Status	R	23	23	62
2525	state of the auxiliary contact				State iD	R	0	0	1
2526	state of the relay				Relay	R	0	0	1
2527	speed percentage calculated for the inverter				Inverter	R	0	0	100
2531	value of the inlet temperature	User	Condenser	Loop	Inlet	R	-99,9	0	99,9
2532	value of the outlet temperature				Outlet	R	-99,9	0	99,9
2533	state of the flow switch contact				Flow iD	R	0	0	1
2541	state of configuration	User	Condenser	Valve	Config.	R	0	0	21
2542	states of management				Status	R	23	23	62
2543	circuit 1, value of the condensing temperature				Cond. 1	R	-99,9	0	99,9
2544	circuit 2, value of the condensing temperature				Cond. 2	R	-99,9	0	99,9
2545	condensing temperature set point				Setting	R	25	30	45
2546	opening percentage calculated for the valve				Opening	R	0	0	100
2611	state of configuration	User	Expansion Valve	SuperHeat C1	Config.	R	0	0	21
2612	states of management				Status	R	23	23	62
2613	value of the evaporating temperature				Evap.	R	-99,9	0	99,9
2614	value of the suction temperature				Suction	R	-99,9	0	99,9
2615	set point of superheat				Setting	R	-72	7	324
2616	value of superheat				S.Heat	R	-99,9	0	99,9
2617	opening percentage calculated for the valve				Opening	R	0	0	100
2621	value of the condensing temperature	User	Expansion Valve	SubCooling C1	Cond.	R	-99,9	0	99,9
2622	value of the liquid temperature				Liquid	R	-99,9	0	99,9
2623	value of subcooling				S.Cool	R	-99,9	0	99,9

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2631	state of configuration	User	Expansion Valve	SuperHeat C2	Config.	R	0	0	21
2632	states of management				Status	R	23	23	62
2633	value of the evaporating temperature				Evap.	R	-99,9	0	99,9
2634	value of the suction temperature				Suction	R	-99,9	0	99,9
2635	set point of superheat				Setting	R	-72	7	324
2636	value of superheat				S.Heat	R	-99,9	0	99,9
2637	opening percentage calculated for the valve				Opening	R	0	0	100
2641	value of the condensing temperature	User	Expansion Valve	SubCooling C2	Cond.	R	-99,9	0	99,9
2642	value of the liquid temperature				Liquid	R	-99,9	0	99,9
2643	value of subcooling				S.Cool	R	-99,9	0	99,9
2711	state of configuration	User	Heater	Gas	Config.	R	0	0	21
2712	states of management				Status	R	23	23	62
2713	burner 1, state of the safety contact				Sta.1 iD	R	0	0	1
2714	burner 1, state of the relay				Relay 1	R	0	0	1
2715	state of the full power relay				High Pow.	R	0	0	1
2716	burner 2, state of the safety contact				Sta.2 iD	R	0	0	1
2717	burner 2, state of the relay				Relay 2	R	0	0	1
2718	opening percentage calculated for the valve				Modul.	R	0	0	100
2721	state of configuration	User	Heater	Electrical	Config.	R	0	0	21
2722	states of management				Status	R	23	23	62
2723	state of the auxiliary contact				State iD	R	0	0	1
2724	1st stage, state of the relay				Relay 1	R	0	0	1
2725	2nd stage, state of the relay				Relay 2	R	0	0	1
2726	power percentage calculated for the triac				Modul.	R	0	0	100
2727	power percentage send to the triac				Output	R	0	0	100
2731	state of configuration	User	Heater	Hot Water	Config.	R	0	0	21
2732	states of management				Status	R	23	23	62
2733	state of the safety freeze contact				Freeze iD	R	0	0	1
2734	opening percentage calculated for the valve				Modul.	R	0	0	100
2741	state of configuration	User	Heater	Pump	Config.	R	0	0	21
2742	states of management				Status	R	23	23	62
2743	setting of functionality				Mode	R	0	0	3
2744	state of the auxiliary contact				State iD	R	0	0	1
2745	state of the relay				Relay	R	0	0	1
2751	state of configuration	User	Heater	Hot Water Reco.	Config.	R	0	0	21
2752	states of management				Status	R	23	23	62
2753	opening percentage calculated for the valve				Modul.	R	0	0	100
2761	1st heaters, setpoint for activation operation of component	User	Heater	Mode	Enable 1	R/W/Z	0	1	1
2762	2nd heaters, setpoint for activation operation of component				Enable 2	R/W/Z	0	1	1
2771	1st heaters, set point for priority inversion starting	User	Heater	Control	Swap 1	R/W/Z	0	0	3
2772	1st heaters, outside air temperature threshold for swap control				Swap 1	R/W	-20	10	50
2773	outside air temperature threshold for unload				Low L. 1	R/W	-20	10	50
2774	2nd heaters, set point for priority inversion starting				Swap 2	R/W/Z	0	0	1
2811	state of configuration	User	Economizer	Damper	Config.	R	0	0	21
2812	states of management				Status	R	23	23	62
2813	minimum opening setting				Minimum	R	0	0	100
2814	opening percentage calculated for the actuator				Opening	R	0	0	100
2815	maximum opening setting				Maximum	R	0	100	100
2816	opening percentage send to the actuator				Output	R	0	0	100
2821	states of management				Status	R	23	23	62

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2822	value of the supply temperature	User	Economizer	Minimum	Supply	R	-99,9	0	99,9
2823	set point of minimum fresh air				Setting	R/W/Z	0	0	100
2824	set value of minimum fresh air in %				Sp Cust.	R	0	0	100
2825	set value of minimum fresh air in °c				Setting	R	1	20	70
2826	opening percentage calculated				Request	R	0	0	100
2827	Damper opening value after calibration				Calib.	R	0	0	100
2828	value of the external signal set point				4-20mA	R	0	0	100
2831	status of freecooling	User	Economizer	Free-Cooling	Status	R	23	23	62
2832	value of the supply temperature				Supply	R	-99,9	0	99,9
2833	temperature threshold for freecooling function				Setting	R	0	0	100
2834	power factor for freecooling function				Power.F	R	0	0	100
2841	status of freeheating	User	Economizer	Free-Heating	Status	R	23	23	62
2842	value of the supply temperature				Supply	R	-99,9	0	99,9
2843	temperature threshold for freeheating function				Setting	R	0	0	100
2844	power factor for freeheating function				Power.F	R	0	0	100
2851	state of configuration	User	Economizer	Air Quality	Config.	R	0	0	21
2852	states of management				Status	R	23	23	62
2853	value of air quality sensor				Value	R	0	0	2000
2854	from the value				From	R	24	29	29
2855	setting of functionality				Mode	R	0	0	1
2856	minimum threshold for control				Minimum	R	0	1000	2000
2857	maximum threshold for control				Maximum	R	0	1500	2000
2858	opening percentage calculated				Request	R	0	0	100
2861	state of configuration	User	Economizer	Exhaust	Config.	R	0	0	21
2862	states of management				Status	R	23	23	62
2863	1st level, state of the relay				Relay 1	R	0	0	1
2864	2nd level, state of the relay				Relay 2	R	0	0	1
2865	3rd level, state of the relay				Relay 3	R	0	0	1
2866	speed percentage calculated for the inverter				Inverter	R	0	0	100

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2871	state of configuration	User	Economizer	Recovery	Config.	R	0	0	21
2872	states of management				Status	R	23	23	62
2873	value of the outside temperature				Outside	R	-99,9	0	99,9
2874	value of the return temperature				Return	R	-99,9	0	99,9
2875	value of the outlet temperature				Outlet	R	-99,9	0	99,9
2876	value of the differential pressure sensor				Delta.P	R	0	0	1000
2877	opening percentage calculated for the by-pass damper				By-pass	R	0	0	100
2878	motor for wheel module, state of the auxiliary contact				Wheel S.	R	0	0	1
2879	motor for wheel module, state of the relay				Wheel R.	R	0	0	1
2881	state of configuration	User	Economizer	Heater	Config.	R	0	0	21
2882	states of management				Status	R	23	23	62
2883	calculated value of the mixing temperature				Mixing	R	-99,9	0	99,9
2884	value of the supply temperature				Supply	R	-99,9	0	99,9
2885	set point				Setting	R	20	30	50
2886	state of the auxiliary contact				State iD	R	0	0	1
2887	state of the relay				Relay	R	0	0	1
2888	power percentage calculated for the triac				Pwm	R	0	0	100
2889	power percentage send to the triac				Output	R	0	0	100
2911	state of configuration	User	Other	Chilled Water	Config.	R	0	0	21
2912	states of management				Status	R	23	23	62
2913	opening percentage calculated for the valve				Opening	R	0	0	100
2921	state of configuration	User	Other	Humififier	Config.	R	0	0	21
2922	states of management				Status	R	23	23	62
2923	state of the external safety contact				State iD	R	0	0	1
2924	state of the relay				Relay	R	0	0	1
2925	power percentage calculated for the proportional signal				Opening	R	0	0	100
2931	online status	User	Other	Power Meter	OnLine	R	0	0	1
2932	value of the real power				Real Pw	R	0	0	3276,7
2933	value of the reactive power				Reac.Pw	R	0	0	3276,7
2934	value of the power factor				P-Factor	R	-32768	0	32767
2935	value of the current, phase a				Cur. P.1	R	0	0	999,9
2936	value of the current, phase b				Cur. P.2	R	0	0	999,9
2937	value of the current, phase c				Cur. P.3	R	0	0	999,9

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3111	unit range configuration	Expert	Unit	Configuration	Range	R/W	0	0	20
3112	unit size configuration				Size	R/W	0	0	168
3113	option set point, quick start after power on				Quick On	R/W	0	0	1
3114	option set point, special fire/smoke safety				Public	R/W	0	0	1
3121	setting of functionality for relay bm n7	Expert	Unit	Cust. Relay	Bm-N7	R/W	30	30	57
3122	setting of functionality for relay bm n12				Bm-N12	R/W	30	30	57
3123	setting of functionality for relay be-1 n1				Be.1-N1	R/W	30	30	57
3124	setting of functionality for relay be-1 n2				Be.1-N2	R/W	30	30	57
3125	setting of functionality for relay be-1 n3				Be.1-N3	R/W	30	30	57
3126	setting of functionality for relay be-1 n4				Be.1-N4	R/W	30	30	57
3131	setting of functionality for digital input bm id4	Expert	Unit	Cust. Switch	Bm-iD4	R/W	30	30	66
3132	setting of functionality for digital input bm id7				Bm-iD7	R/W	30	30	66
3133	setting of functionality for digital input be-1 id1				Be.1-iD1	R/W	30	30	66
3134	setting of functionality for digital input be-1 id2				Be.1-iD2	R/W	30	30	66
3135	setting of functionality for digital input be-1 id3				Be.1-iD3	R/W	30	30	66
3136	setting of functionality for digital input be-1 id4				Be.1-iD4	R/W	30	30	66
3141	setting of functionality for analog input be-1 b1	Expert	Unit	Cust. Signal	Be.1-B1	R/W	30	30	39
3142	setting of functionality for analog input be-1 b2				Be.1-B2	R/W	30	30	39
3143	setting of functionality for analog input be-1 b3				Be.1-B3	R/W	30	30	39
3144	setting of functionality for analog input be-1 b4				Be.1-B4	R/W	30	30	39
3145	threshold temperature for 4ma external sensor				T. 4mA	R/W	-99,9	-40	99,9
3146	threshold temperature for 204ma external sensor				T. 20mA	R/W	-99,9	80	99,9
3151	DC60/ DM60 Configuration	Expert	Unit	DC-DM	Remote	R/W	0	0	1
3152	selecting the display mode for set point (k or °c)				Sp Cust.	R/W	0	0	1
3153	lower threshold temperature for set point customer				Low Sp	R/W	8	17	35
3154	upper threshold temperature for set point customer				High Sp	R/W	8	27	35
3155	activation of the authorization to use old display or standard carel				DS Lennox	R/W	0	0	1
3171	address of the unit (bus id)	Expert	Unit	Master/Slaves	Address	R	1	1	24
3172	setting the sub-bus				Bus	R/W	1	1	24
3173	setting the master of the bus				Master	R/W	0	0	24
3174	number of compressors for token function or number of units				Number	R/W	0	0	96
3175	setting of functionality				Function	R/W	0	0	4
3176	activation of the function slaves works like master				Together	R/W	0	0	1
3177	choice of outside temperature management				Outside	R/W	0	0	2
3178	choice of room temperature management				Room	R/W	0	0	2
3179	choice of air quality management				Air Q.	R/W	0	0	2
3181	address of the unit (bus id)	Expert	Unit	BMS	Address	R/W	1	1	207
3182	setting of the protocol type				Type	R/W	0	2	6
3183	configuration of communication bus speed				Baud	R/W	0	3	4
3184	watchdog counter				Watchdog	R/W	0	0	32767
3191	management of set points	Expert	Unit	Lennox	Restore	R/W	0	0	5
3192	reserved for technicians lennox				Tests	R/W	7	7	48

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3211	choice of the control (room temperature or supply)	Expert	Control	Configuration	Mode	R/W	0	0	1
3212	advanced control pack configuration				Humidity	R/W	0	0	1
3213	choice of the room sensor temperature				Room T.	R/W	0	0	5
3214	choice of the outside sensor temperature				Out. T.	R/W	0	0	5
3215	choice of the room sensor humidity				Room Hr.	R/W	0	0	5
3216	choice of the outside sensor humidity				Out. Hr.	R/W	0	0	5
3221	offset for room temperature value	Expert	Control	Room	Offset	R/W	-5	0	5
3222	room temperature threshold for unloading cooling mode				Limit C.	R/W	0	0	40
3223	room temperature threshold for unloading heating mode				Limit H.	R/W	0	40	40
3224	external value of set point for control temperature				4-20mA	R	-5	0	5
3225	Dynamic set point (cooling setpoint offset according to outside temperature)				Sp.Dyna.	R/W/Z	0	20	20
3226	set point of cooling mode				Sp.Cool.	R/W/Z	8	22	35
3227	set point of heating mode				Sp.Heat.	R/W/Z	8	19	35
3228	integral time control for cooling mode				Ti.Cool.	R/W	10	60	120
3229	integral time control for heating mode				Ti.Heat.	R/W	10	60	120
3231	activation of the smoothing function of temperature	Expert	Control	Supply	Smooth	R/W/Z	0	0	1
3232	low limit threshold in cooling mode				Lim.Cool	R/W	4	4	58
3233	high limit threshold in heating mode				Lim.Heat	R/W	4	38	58
3234	offset for high limit threshold in cooling mode				Adj.Cool	R/W	-5	0	5
3235	offset for low limit threshold in heating mode				Adj.Heat	R/W	-5	0	5
3236	outdoor temperature low threshold for slope on the supply temperature setpoint				Out.Low	R/W	-20	0	50
3237	coefficient of the low outside temperature for the slope of the supply temperature setpoint				Coef.Low	R/W	-50	0	50
3238	outdoor temperature high threshold for slope on the supply temperature setpoint				Out.High	R/W	-20	30	50
3239	coefficient of the high outside temperature for the slope of the supply temperature setpoint				Coef.High	R/W	-50	0	50
3241	setpoint for activation operation of control	Expert	Control	Humidity	Enable	R/W/Z	0	0	1
3242	set point of dehumidification				Sp. Deh.	R/W/Z	0	100	100
3243	set point of humidification				Sp. Hum.	R/W/Z	0	0	100
3244	integral time control for dehumidification				Ti. Deh.	R/W	10	60	120
3245	integral time control for humidification				Ti. Hum.	R/W	10	60	120
3251	lower supply temperature threshold, 1st level of alarm	Expert	Control	Safety	Sup Lo.1	R/W	5	6	19
3252	lower supply temperature threshold, 2nd level of alarm				Sup Lo.2	R/W	1	2	17
3253	upper supply temperature threshold, 1st level of alarm				Sup Hi.1	R/W	20	40	70
3254	upper supply temperature threshold, 2nd level of alarm				Sup Hi.2	R/W	20	60	70
3255	lower room temperature threshold of alarm				Room Lo.	R/W	5	5	40
3256	upper room temperature threshold of alarm				Room Hi.	R/W	5	40	40
3257	dew point control				DewPoint	R/W	0	0	1
3258	lower room humidity threshold of alarm				Room Lo.	R/W	0	0	100
3259	upper room humidity threshold of alarm				Room Hi.	R/W	0	100	100

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3261	state of unload cooling mode by BMS	Expert	Control	Bms	Cool.Mod	R/W	0	0	1
3262	state of unload cooling mode by BMS				Heat.Mod	R/W	0	0	1
3263	value of the outside temperature send by BMS				Out. T.	R/W	-99,9	-99,9	99,9
3264	value of the room temperature send by BMS				Room T.	R/W	-99,9	-99,9	99,9
3265	value of the outside humidity send by BMS				Out. Hr.	R/W	0	0	100
3266	value of the room humidity send by BMS				Room Hr.	R/W	0	0	100
3311	choice of air flow sensor	Expert	Blower	Configuration	AirFlow	R/W	0	0	1
3312	choice of inverter				Modul.	R/W	0	0	2
3313	choice of kit				Kit	R/W	0	0	5
3314	choice of motor size				Motor	R/W	0	0	10
3315	choice of fan type				Fan	R/W	0	0	4
3321	setpoint for activation operation of component	Expert	Blower	Mode	Enable	R/W/Z	0	1	1
3322	setpoint for activation operation in room control dead zone				Dead Z.	R/W/Z	0	0	1
3323	temperature threshold for activation night refreshment function				Night Eco	R/W	8	22	35
3331	setting of functionality	Expert	Blower	Speed	Function	R/W/Z	0	0	2
3332	choice of mode (% or qv)				Mode	R/W	0	0	1
3333	nominal threshold for air flow control				Flow H.	R/W/Z	0	~	100
3334	low threshold for air flow control				Flow L.	R/W/Z	0	~	100
3335	coefficient for compensation of losses of the air damper				Coef.	R/W	-100	0	100
3336	minimum threshold for air flow control				Minimum	R/W	0	~	100
3337	maximum threshold for air flow control				Maximum	R/W	0	~	100
3341	choice of air flow sensor	Expert	Blower	Safety	Config.	R	0	0	2
3342	value of the air flow sensor				Delta.P	R	0	0	1000
3343	air flow threshold alarm				Air Flow	R/W	0	25	1000
3344	filters missing threshold alarm				Missing	R/W	0	50	1000
3345	dirty filters threshold alarm				Dirty	R/W	50	250	1000
3351	low speed forced by BMS	Expert	Blower	BMS	Bms Low	R/W	0	0	1
3352	high speed forced by BMS				Bms High	R/W	0	0	1
3353	value of the speed send by BMS				Bms Val.	R/W	0	0	100
3411	choice of modulated compressor	Expert	Compressor	Configuration	Modul.	R/W	0	0	2
3412	configuration of leak detection management				Leak Det.	R/W	0	0	1
3413	configuration of sensors installed on the circuits				Sensor	R/W	0	4	4
3421	setpoint for activation operation of all compressor, cooling/heating mode	Expert	Compressor	Mode	Enabled	R/W/Z	0	1	1
3422	enable circuit 1, separate comp.1 or/and comp.2				Enable.1	R/W	0	0	3
3423	enable circuit 2, separate comp.1 or/and comp.2				Enable.2	R/W	0	0	3
3424	state of unload 50% by BMS				Bms 50%	R/W	0	0	1
3425	state of unload 100% by BMS				Bms Unl.	R/W	0	0	1
3426	state of unload heatpump by BMS				Bms HPum	R/W	0	0	1
3431	setpoint for activation operation in cooling mode	Expert	Compressor	Cooling	Enabled	R/W/Z	0	1	1
3432	outside air temperature threshold, unload 50% of compressors				Low L50%	R/W	-10	20	50
3433	outside air temperature threshold, unload 100% of compressors				Low L.	R/W	-10	12	50
3434	delta-t of one compressor				Delta T.	R/W	1	8	20
3435	integral time control, compressor in cooling mode				Ti.	R/W	5	30	120
3441	setpoint for activation operation in heating mode	Expert	Compressor	Heating	Enabled	R/W/Z	0	1	1
3442	outside air temperature threshold, unload 50% of compressors				Low L50%	R/W	-20	-20	50
3443	outside air temperature threshold, unload 100% of compressors				Low L.	R/W	-20	-20	50
3444	delta-t of one compressor				Delta T.	R/W	1	8	20
3445	integral time control, compressor in heating mode				Ti.	R/W	5	30	120
3511	set point of configuration	Expert	Condenser	Configuration	Type	R/W	0	0	1
3512	choice of modulation mode				Modul.	R/W	0	0	4

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3521	choice of control mode	Expert	Condenser	Control	Mode	R/W/Z	0	0	3
3522	set point of the condensing temperature				Cond.	R/W	25	30	45
3523	speed percentage for reduced mode				Reduced	R/W	70	70	100
3524	ti set point for pid control				Ti.	R/W	70	70	100
3531	lower water temperature threshold	Expert	Condenser	Savety	Low L.	R/W	4	5	20
3532	upper water temperature threshold				High L.	R/W	20	45	50
3533	opening percentage valve for freeze protection				Leak	R/W	0	0	50
3534	outside air temperature threshold to activate function				Onset	R/W	-20	-20	50
3541	outside air temperature threshold to activate function	Expert	Condenser	Defrost	Onset	R/W	8	16	22
3542	ratio for dynamic management				Ratio	R/W	0	1,4	2
3543	minimum time between two defrost				Timeout	R/W	30	45	90
3544	number restart of fans for the end of cycle				Restart	R/W	1	3	5
3545	choice of one compressor by tandem during defrost				1/2 Tand	R/W	0	0	1
3546	state of defrost cycle delayed by BMS				Bms Wait	R/W	0	0	1
3611	set point of configuration	Expert	Expansion Valve	Configuration	Option	R/W	0	0	1
3621	set point of superheat	Expert	Expansion Valve	Circuit 1	S.Heat	R/W	3	5	10
3622	kp set point for pid control				Kp	R/W	0	7	30
3623	ti set point for pid control				Ti	R/W	0	60	360
3624	td set point for pid control				Td	R/W	0	2	9
3625	offset for pressure sensor				Offset	R/W	-5	0	5
3626	offset for temperature probe				Offset	R/W	-5	0	5
3627	choice of manual mode				Manual	R/W	0	0	1
3628	value of number of steps for manual mode				Steps	R/W	0	0	480
3631	set point of superheat	Expert	Expansion Valve	Circuit 2	S.Heat	R/W	3	5	10
3632	kp set point for pid control				Kp	R/W	0	7	30
3633	ti set point for pid control				Ti	R/W	0	60	360
3634	td set point for pid control				Td	R/W	0	2	9
3635	offset for pressure sensor				Offset	R/W	-5	0	5
3636	offset for temperature probe				Offset	R/W	-5	0	5
3637	choice of manual mode				Manual	R/W	0	0	1
3638	value of number of steps for manual mode				Steps	R/W	0	0	480
3711	1st heaters, set point of configuration	Expert	Heater	Configuration	Main	R/W	0	0	7
3712	2nd heaters, set point of configuration				2nd	R/W	0	0	2
3713	Hot water pump, set point of configuration				Pump	R/W	0	0	1

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3721	1st heaters, setpoint for activation operation of component	Expert	Heater	Mode	Enable.1	R/W/Z	0	1	1
3722	1st heaters, state of unload 50% by BMS				Bms 50%	R/W	0	0	1
3723	1st heaters, state of unload 100% by BMS				Bms Unl.	R/W	0	0	1
3724	2nd heaters, setpoint for activation operation of component				Enable.2	R/W/Z	0	1	1
3731	1st heaters, set point for priority inversion starting	Expert	Heater	Control	Swap 1	R/W/Z	0	0	3
3732	1st heaters, outside air temperature threshold for swap control				Swap 1	R/W	-20	10	50
3733	1st heaters, outside air temperature threshold for unload				Low L. 1	R/W	-20	10	50
3734	1st heaters, delta-t of one stage				DeltaT.1	R/W	1	8	20
3735	1st heaters, integral time control				Ti. 1	R/W	5	30	120
3736	2nd heaters, set point for priority inversion starting				Swap 2	R/W/Z	0	0	1
3737	2nd heaters, delta-t of one compressor				DeltaT.2	R/W	1	8	20
3738	2nd heaters, integral time control				Ti. 2	R/W	5	30	120
3751	set point of limit maximum power	Expert	Heater	Electrical	TriacMax	R/W	0	100	100
3761	opening percentage valve for freeze protection	Expert	Heater	Hot Water	Leak	R/W	0	0	50
3762	outside air temperature threshold to activate function				Onset	R/W	-20	-20	50
3763	choice to close or open valve in case of freezing alarm				Freeze	R/W	0	0	1
3771	setting of functionality	Expert	Heater	Pump	Mode	R/W	0	0	3
3781	opening percentage valve for freeze protection	Expert	Heater	Hot Water Reco.	Leak	R/W	0	0	50
3782	outside air temperature threshold to activate function				Onset	R/W	-20	-20	50
3811	configuration of fresh air damper	Expert	Economizer	Configuration	Damper	R/W	0	0	2
3812	configuration of air quality sensor				Co2	R/W	0	0	2
3813	choice of recovery module				Recov.	R/W	0	0	4
3814	configuration of fresh air electrical heaters				Heater	R/W	0	0	2
3815	choice of exhaust fan				Exhaust	R	0	0	2
3816	choice of kit				Kit	R/W	0	0	5
3817	choice of motor size				Motor	R/W	0	0	10
3818	choice of fan type				Fan	R/W	0	0	4
3821	set point of minimum fresh air	Expert	Economizer	Control	Minimum	R/W/Z	0	0	100
3822	set point of maximum fresh air				Maximum	R/W	0	100	100
3823	integral time control fresh air damper				Ti.	R/W	5	10	120
3824	state of enthalpy function				Enthalpy	R/W	5	10	120
3825	state of calibration function				Calib.	R/W	0	0	1
3826	state of opening to 0% by BMS				Bms 0%	R/W	0	0	1
3827	state of opening to 100% by BMS				Bms 100%	R/W	0	0	1
3831	setpoint for activation operation of function	Expert	Economizer	Free-Cooling	Enabled	R/W/Z	0	1	1
3832	outside lower temperature threshold, unload				Low L.	R/W	-20	-20	50
3833	outside upper temperature threshold, unload				High L.	R/W	-20	26	50
3834	state of unload by BMS				Bms Unl.	R/W	0	0	1
3841	setpoint for activation operation of function	Expert	Economizer	Free-Heating	Enabled	R/W/Z	0	1	1
3842	outside lower temperature threshold, unload				Low L.	R/W	-20	14	50
3843	outside upper temperature threshold, unload				High L.	R/W	-20	40	50
3844	state of unload by BMS				Bms Unl.	R/W	0	0	1

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3851	setpoint for activation operation of function	Expert	Economizer	Air Quality	Enabled	R/W/Z	0	1	1
3852	setting of functionality				Mode	R/W	0	0	1
3853	minimum threshold for control				Minimum	R/W	0	1000	2000
3854	maximum threshold for control				Maximum	R/W	0	1500	2000
3855	upper air quality threshold of alarm				Limit	R/W	0	1500	2000
3856	state of unload by BMS				Bms Unl.	R/W	0	0	1
3857	value of the air quality send by BMS				Bms Val.	R/W	0	0	2000
3861	opening percentage threshold of actuator for 1st fan	Expert	Economizer	Exhaust	Step 1	R/W	0	33	100
3862	opening percentage threshold of actuator for 2nd fan				Step 2	R/W	0	50	100
3863	opening percentage threshold of actuator for 3rd fan				Step 3	R/W	0	66	100
3864	nominal threshold for air flow control				Flow H.	R/W	0	~	100
3865	low threshold for air flow control				Flow L.	R/W	0	~	100
3866	coefficient for compensation of losses of the air damper				Coef.	R/W	-100	0	100
3871	setpoint for activation operation of component	Expert	Economizer	Recovery	Enabled	R/W/Z	0	1	1
3872	setpoint of delta-t (outside/return) for starting wheel motor				Delta.T	R/W	1	4	10
3873	outside air temperature threshold to activate defrost function				Defrost	R/W	-20	5	20
3874	delta-t threshold (outside/outlet) for alarm				Safety	R/W	0	2	5
3875	dirty filters threshold alarm				Filters	R/W	50	250	500
3881	setpoint for activation operation of component	Expert	Economizer	Heater	Enabled	R/W/Z	0	1	1
3882	set point of condensing control				Sp Temp.	R/W	20	30	50
3883	delta-t of full capacity				Delta T.	R/W	1	8	20
3911	set point of configuration	Expert	Other	Chilled Water	Config.	R/W	0	0	1
3912	setpoint for activation operation of component				Enabled	R/W/Z	0	1	1
3913	integral time control				Ti.	R/W	5	30	120
3921	set point of configuration	Expert	Other	Humidifier	Config.	R/W	0	0	2
3922	integral time control				Ti.	R/W	10	60	120
3931	power meter configuration	Expert	Other	Power Meter	Config.	R/W	0	0	1
3932	address of the power meter in the rs485 bus				Address	R	21	21	21
3933	speed of the rs485 bus				Baud	R	19200	19200	19200
3934	parity of the rs485 bus				Parity	R	0	0	0
3935	communication on rs485 is correct				OnLine	R	0	0	1
3936	value of the current, instantaneous				Current	R	0	0	999,9
3937	current threshold for unloaded 50% of compressors				Max.Cur.	R/W	0	0	999,9
3938	value for reset power meter memory				Code	R/W	-32768	0	32767

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